

The United States Miller

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THE MILWAUKEE MILLING COMPANY'S NEW MILL.

In our January number we congratulated our readers on the fact that the old idea of secrecy in milling was rapidly becoming a relic of the past, and that in this age of progress millers have at last become willing to make public those things which they have discovered by experiment to be of value to the fraternity. After months of correspondence and effort on our part, we were able to secure from the proprietors a complete description with illustrations of both the exterior and interior of the great Pesth Roller Mill in Hungary, which we published in October. This was entirely a new departure for them, as their mill is kept constantly guarded, and no one unless an employee is allowed to go through the mill; much less to publish a description of its interior. This departure from old established customs on the part of our Hungarian friends is exceedingly gratifying, and we doubt not but their generous example will be followed by the owners of model mills in this and other countries, as it is by the Milwaukee Milling Company in this article. It will certainly prove beneficial to all. As anticipated in our January number of the UNITED STATES MILLER we have now the pleasure of presenting to our readers a description illustrated by two views, Fig. 1 representing the outside view, and Fig. 2 a view of the grinding floor of the new mill recently erected in this city by the Milwaukee Milling Company on the corner of Canal and Cherry streets, on the bank of the Milwaukee River, which is navigable to the mill for the largest class of steam and sailing crafts that navigate the great chain of American lakes. The great desideratum in milling is to discover an easier, simpler, cheaper and consequently better method of reducing wheat to flour than by the old system with the old fashioned great cumbersome mill-stone. This has been accomplished by the Milwaukee Milling Company by the use of the Jonathan Mills' patent grinding mills, in which the under stone is the runner and is held rigidly to the spindle. These mills are manufactured solely by the Milwaukee Middlings Millstone Company of this city. In other respects it is very similar to other modern built new process flour mills. Jonathan Mills has long maintained the theory that small stones with more perfect construction would produce better results than the ordinary four-foot stone, and in the early part of 1876 commenced a series of experiments to ascertain what the proper size of a millstone should be. His first experiment was with a finely-built 5½ inch rigid under-runner. The result was so gratifying that no difficulty was found in organizing a stock company with ample capital to carry on the experiments to perfection. This having been accomplished, the Milwaukee Milling Company has constructed the mill here illustrated.

The mill is a handsome and substantial five story brick structure, 50 feet wide by 60 long, surmounted by a cupola 12 feet wide, 40 long and 10 high. The annex for engine and boiler is located on the north side of the mill building proper, and 80 feet wide by 60 long with a brick chimney 100 feet high. Both water and steam power is used. The engine is an improved Corliss with 20 x 48 inch cylinder with condenser, and the steam is furnished by two 54-inch boilers 16 feet in length, having 89 four-inch flues and a steam dome extending across them.

The line shaft is driven by the engine from an 18-foot band fly wheel weighing 9 tons and

carrying a 24-inch belt to a 77-inch pulley. All of the 33 mills and 4 sets of chilled iron rolls are driven from this line shaft. The rest of the machinery is driven from the engine shaft and an upright shaft geared from the engine shaft.

The basement 40 x 60 and 13 feet 7 inches in height contains the wheat cleaning machinery, consisting of oat separator, smutter and wheat brush machines.

The grinding floor presents a scene of great interest to the visitor. There are thirty-three run of finely built and handsomely finished grinding mills set in three rows, two of which extend clear across one end of the mill from wall to wall, as closely as they can be set to each other, all running as regularly and quietly as so many clocks,—each one doing quite as much work as a 4-foot stone; turning out 400 barrels of flour per day, and could as easily

twelve middlings purifiers, of Smith Bros.' make, all large size, being 12 feet in length, and using cloth 40 inches wide. Three of these purifiers are on the first floor above the grinding floor, four on the second and five on the fourth floor.

The grinding mills were made by the Milwaukee Middlings Millstone Company, who are the owners and sole manufacturers of the patent for the United States and Europe. Four pair of chilled iron rolls, 12 by 24 inches, are all built in one strong wooden frame. These rolls were all manufactured, ironed and mounted by Filer, Stowell & Co., who also manufactured all the other machinery of the mill. The stock hoppers for wheat, also the middlings bins, are on the second floor. The wheat storage bins also start from the ground floor and extend up through the two next floors.

On the third floor are located two chests of

floor showing the grinding mills, the manner of driving them by reel belts, location of packers, etc. Throughout the mill the modern appliances for successful milling have been everywhere introduced, and this model institution will surely attract the attention of progressive millers throughout the country. Geo. Smith, of the firm of Smith Bros., the well-known Milwaukee millwrights, planned and superintended the millwright work, and it is a credit to his ability as a millwright. William Kuecker is the head miller.

The mill has now been running over two months, and gives entire satisfaction. The flour sells readily as fast as made at the highest market prices. These results, considering the starting up of an entirely new mill, are really wonderful.

The Milwaukee Milling Company are so well satisfied with the operation of these patent

grinding mills, manufactured by the Milwaukee Middlings Millstone Co., that they are already having plans drawn with a view to the early construction of an addition to their mill, which will more than double it in size and in number of runs of stone. It appears to be now a settled fact that the use of these small stone in the manufacture of flour is a great improvement on the old-fashioned large stone. It is claimed that these mills will produce a greater quantity of middlings and consequently of high grade flour from the same grade of wheat more quickly and by a less expenditure of power than by any process yet tried. The mills require little attendance, and are not liable to get out of order. The proprietors of this mill cordially invite mill-owners visiting this city to visit their mill and we doubt not but many will avail themselves of their invitation.

THE Bakers' Record (London), in its annual review, says: "Side by side of the baking trade, the millers have made a determined effort to amend their condition, which, of the two, is worse than the bakers. They had succeeded in forming a Central Association, and likewise several provincial branches, but their first official document proved a very crude affair, and soon came to grief. Still there is no reason why they should be disheartened. They made a false step by thinking too much of their own interest and too little of the bakers'. A little sober thought, however, will soon rectify the blunder, and if they confer with those who must be a party to the development of any

grand measure of reform for the mutual protection of the two sections of the trade, we may expect something of greater promise. It is much to know the millers are casting aside those jealous feelings they have hitherto entertained towards each other, and more to think the time is not far distant when the combined intelligence of a wealthy class of commercial men will devise some common plan of action, which shall be both prudent and practicable. The Weights and Measures Act has been most minutely reviewed by the millers, and it appears to be their desire to amend the present measure; but, on the other hand, the bakers seem quite satisfied with the present standard, and are inclined to think that an alteration would cause much inconvenience. Whether an interchange of opinions upon this subject between the millers and bakers would lead to a mutual arrangement, we are not in a position to say—it is enough for us to perceive the spirit of inquiry is aroused and, when once investigation proceeds upon her task, we need not fear that some work of utility will be the result.

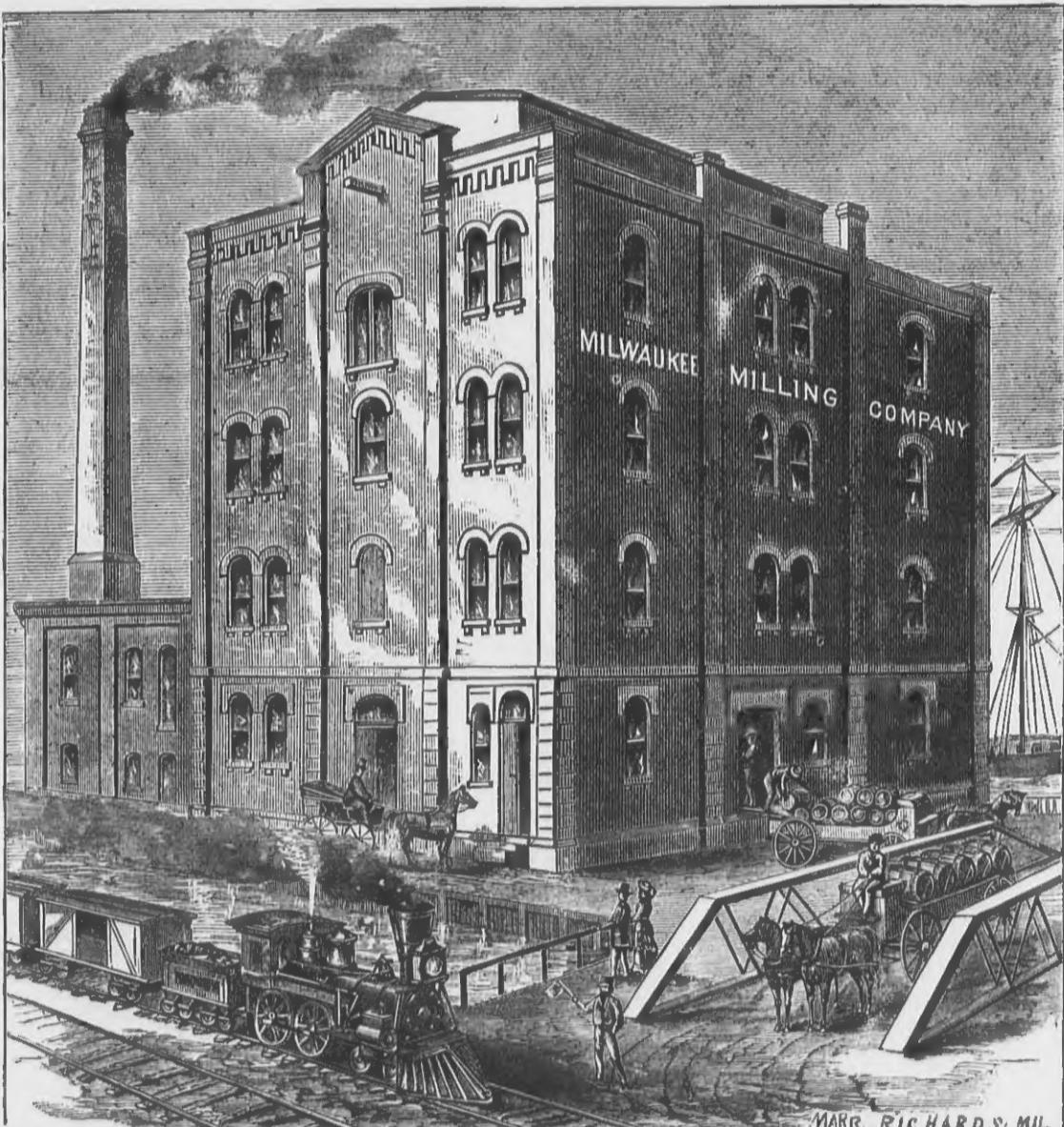


FIG. 1. MILWAUKEE MILLING COMPANY'S MILL, MILWAUKEE, WIS.

turn out 450 to 500 if they had sufficient bolting and purifier capacity. There are four packers on this floor, one for bran and the remaining three are flour packers. A very important fine feature in the mill is the fact that no low grades of flour are produced,—making but two grades: a very large percentage of a choice patent and a straight extra grade, coming up to the highest standard in all the markets. No red dog flour is made in the mill.

Here are also suitable scales for weighing flour and receiving scales for weighing wheat from wagons.

As above stated, the mill contains 33 of Jonathan Mills' small grinding mills, with rigid under-runners. Twenty-two of these have stones 16 inches in diameter. All the wheat is passed through steam heaters and ground on fifteen of the 16-inch mills. Two 16-inch mills grind the shipstuff, and five 16-inch mills grind middlings, as also do five of the 20-inch mills. Three of the 24-inch mills are used in grinding bran, two grind middlings, and one grinds shipstuff. There are

bolts with 8 reels, each 18 feet long which pass up and extend through the fourth floor. The bran middlings and wheat storage bins extend up through the third floor. There is one bran duster on the third floor. The fourth floor has one large receiving separator. The two light reeled bolting chests are on this floor. The cupola is hopped off to a long conveyor and is used as a dust room for all the 12 purifiers to blow into. The conveyor under the cupola conveys all the dustings therein gathered out and empties them into a reel on the fourth floor, where they are bolted and disposed of. There is also a short reel on the fourth floor 7 feet long and 32 inches in diameter, covered with wire cloth. This reel handles the bran from the bran duster, separating the shorts from the bran. From this reel the bran goes direct to the bran bin over the bran packer.

There are 16 elevators in the mill, nearly all of which are placed near the walls so as to prevent as few obstructions as possible. The reader can gain almost a perfect idea by looking at the cut illustrating the grinding

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MILWAUKEE, FEBRUARY, 1879.

THE UNITED STATES MILLER has the largest circulation of any milling journal published in America, and was the first milling journal started in America entirely independent of connection of interest with some machine or millfurnishing establishment.

AN INVITATION.—We cordially invite all millers, millwrights, millfurnishers and inventors of milling machinery to call on the UNITED STATES MILLER when visiting this city.

IMPORTANT NOTICE.

TO THE PARTY RECEIVING THIS PAPER WHO IS NOT ALREADY A PAID SUBSCRIBER.

We hereby extend to you a cordial invitation to become a subscriber to the UNITED STATES MILLER. We shall endeavor to make it of the greatest possible use and benefit to the milling fraternity, and no mill should be without it. The best talent that we can obtain in this and other countries will contribute to its columns, which will also be enriched by carefully translated articles on subjects of interest to the craft. To those who will send us One Dollar in thirty days from date of this notice we will send THE UNITED STATES MILLER from Feb. 1st, 1879, to May 1st, 1880. Enclose money or stamps in an envelope, seal carefully, and send at our risk. By return mail you will receive a receipt therefor. Address

THE UNITED STATES MILLER,
Feb. 1st, 1879. Milwaukee, Wis.

WE have received a copy of *The Farm*, an agricultural paper published by Messrs. Thos. M'Kenzie & Sons, of Dublin, Ireland. We cordially welcome it to our exchange table.

WE recently received the first number of the new French milling journal *Le Meunier*, published in Paris by L. Vigreux, civil engineer, 16 Rue de Birague. The subscription price to subscribers in this country is 15 francs post paid. This new journal presents many commendable features and it has a good field to work in. We wish Monsieur L. Vigreux and his new journal success.

MESSRS. HERZER BROS., the well-known mill pick manufacturers of Milwaukee, inform us that "a party by the name of Brown" is traveling around through Wisconsin representing himself to be connected with their firm, and is taking orders for sharpening mill picks. He was last heard from at Ardkdale, Wis. Messrs. Herzner Bros. have no traveling agents out. Their advertisement can always be found in the columns of this and other reliable milling journals, and their work is well-known to be first-class. Millers are requested to be on their guard.

THE Edw. P. Allis Company are now building a 28x60 improved Corliss engine for the St. Louis cotton mills, also a 20-inch cylinder and regulator for the Springfield, Mo., cotton mills, where they guarantee a saving of 33% per cent of fuel. They are also building a 28-inch cylinder for the Reliance Mills of Milwaukee, and a 40-horse power engine for the Evening Wisconsin new building. They have also closed a contract for the new 20-run mill of E. V. White & Co., at Minneapolis, Minn., and have sold over fifty roller mills during the month of January.

IN this number we commenced the publication with illustrations of a very interesting article on grain and its manufactured products. This article has been translated for us from the German with the personal permission of the author, Dr. Herman Klencke, of Hanover, Germany, a very distinguished authority. Our readers should preserve files of these papers for future reference. It will be to the interests of all our readers to keep their subscriptions paid up so as not to miss any numbers, as we will not promise to supply back numbers. Those not already subscribers will do well to begin at once.

LEGAL NOTES.

Several suits for alleged infringement of the patent rights of the Birdsell Clover Huller and Separator Company, of Fort Wayne, Ind., have been brought in the United States Court in Milwaukee, Wis., and will be tried during the present term. Testimony will be taken before

Edward Kurtz, Master of Chancery, to whom the suits have been referred for that purpose, on Wednesday, the 16th of January. Bills in equity were served on a large number of defendants in Calumet, Fond du Lac and Green Lake counties. The complaints apply for injunctions against the use of the machine claimed by the Birdsell Company to be an infringement on their own.

THE celebrated Woodbury planing machine patent case was brought to a conclusion in the United States Court in Boston January 28th. The Court held that the patent could not be sustained. This case has been in litigation for 30 years. The patent covered nearly all the planing machines in the United States, valued at from thirty to forty million dollars.

THE COCHRANE CASE.

WHY There Be a Compromise?

The case of the American Middlings Purifier Co. vs. the Empire Milling Co. and other St. Louis millers is set for hearing on February 10th, at St. Louis. Some of the members of the committee of the National Association who have the defense in hand declare that in view of the fact that such a large proportion of the millers have held aloof from joining its association and aiding to carry on the defense, that they are willing to make a compromise. They are tired of the fellows that have been sitting on the fence so long. For this reason alone they may be willing to effect a compromise for members of the association which they could have undoubtedly done a long time ago if they had wanted to on the most favorable terms. Of course, if a compromise is made, the testimony which the association has spent so much time and money in preparing would be turned over to be locked up or used by the prosecution. From the foregoing views expressed warmly and openly to us by a member of the committee, it looks to us as if millers who have not joined the association before February 10th will have to, as the saying is, "either fish, or cut bait."

SHALL OUR MILLERS MAKE ADULTERATED FLOUR?

Some time since an article was published in this journal, written by Dr. Henry A. Mott, an eminent New York chemist, declaring many of the baking powders used in this country to be injurious to the health of consumers, more especially for the reason that they contained a large percentage of alum. Dr. Mott mentioned the name of one baking powder which he claimed to be pure, and gave the component parts of others which he claimed to be injurious. Of course this startled the baking powder manufacturing companies all over the country, and they each have been endeavoring to show that their powders were not injurious. Their position is maintained by the statements of Mr. Henry Pemberton, another eminent chemist.

The four baking powders singled out as being especially deleterious, upon analysis were found to be composed nearly altogether of burnt alum, bicarbonate of soda and starch. The alum and bicarbonate of soda are the active ingredients, and are present in nearly equal quantities. The combination, according to Mr. Pemberton, produces a reaction, during the process of baking, that completely neutralizes two substances, so far as harmful properties are concerned, alum and soda, as such, being removed, and replaced by "carbonic acid gas, sulphate of soda, and precipitated and insoluble ammonia." Mr. Pemberton's views are fortified by results of actual experiments made by Dr. Doremus, of Bellevue Hospital, New York, who states that in biscuits made with a baking powder containing 26.45 per cent. of alum, he failed to find any trace of alum or other deleterious substance.

After referring to the foregoing conflicting views of eminent chemists on the subject, the *American Miller* says: "The statements of Mr. Pemberton and Dr. Doremus place the use of alum in a new light. If, when used in about equal quantities with bicarbonate of soda, the alum is rendered harmless, and the two substances are entirely neutralized, there is no good reason why millers should not use the two substances, when they can do so with advantage. We shall always advise millers to rely on good milling to produce good flour. But sometimes it is difficult for the miller to produce a white flour, and a fastidious public is very exacting on that point. Under such circumstances there could be no harm in enhancing the color by a little harmless bleaching, by means of alum and bicarbonate of soda."

We are decidedly opposed under any consideration to adulterating flour under any pretext whatever. No honest miller, we think, can consistently mix alum and carbonate of soda with his flour. It is, to say the least, adulteration, and mixing chalk, gypsum and other base stuffs with flour can be called by no

harsher name. Millers must furnish pure unadulterated flour. If the consumers want to adulterate it with any substance, they can do so easily enough, and those that want pure bread unadulterated can have it. We confess surprise that our Chicago contemporary should under any circumstances recommend millers to turn on the market adulterated flour. Already the newspapers are teeming with accounts of adulterations in sugars, syrups, candy, coffee, tea, and a thousand other articles. If we can stand all these, perhaps we might stand a little adulterated flour, but if possible, we prefer to be excused.

DOES THE MODERN SYSTEM OF MILLING PAY?

A Subject that will Bear Considerable Discussion.

[Special correspondence of the United States Miller from Scotland.]

One of the most common terms used in relation to the new process is the word granulating. As to the origination of the term they appear to think that gradual reduction causes an improvement in the baking qualities of the flour, by being less destructive on the natural granules of the kernel, which shows their limited acquaintance with milling, although boasted of as a scientific idea. Experience shows that this supposition has no influence whatever; thus soft tough wheat, which requires the cutting quality well developed to make it good working flour, is totally spoiled by rollers or a slow blunt stone for good baking qualities, except kept a long time afterwards. This injurious compression cannot be avoided except the speed or keenness of edge is such as to chip the particles off with a mild pressure. As illustrated in an extreme degree by a cannon ball carrying a man's head off without affecting the body much, surely the integrity of the granules cannot be respected in this instance.

Take the opposite extreme again, grinding weak hard: Experience shows that quite an opposite course is necessary; it is hard and brittle, and attempting to cut it would cause a heavy proportion of dust, from the violent contact with an article too hard to cut, except with such a high friction rate that the bran would be badly cut up. Now, say it was crushed only so small as to make very sharp flour,—what is the baker's experience with such? He has the greatest difficulty in getting it to adhere, and in spite of all he can do it makes short, harsh, badly-raised bread; the particles break off with a clean, glassy splinter, causing bad color and bad adherence. Now, the smaller you break an article the less it inclines to make a clean splinter, till once a stage is arrived at that the splintering or tearing asunder assumes more of a bursting character, causing rough, irregular white surfaces, from the numerous small projections or torn-out filaments from the extra crushing required to disintegrate it. In this state it is an easy working flour with the baker. It needs little pounding to make the rough edges adhere; in fact, too much pounding spoils it, the tender, torn-out filaments or projections being readily torn away from the particles by too much pounding; carefully dealt with, the exceeding smallness of the particles make a fine white, tender, delicate loaf. Can the granules be saved any by this minute tearing asunder beyond the clean splintering process? Most assuredly not. Again, some of the granulating theorists talk of the bran being rolled off the wheat. What is the miller's experience in reality? Quite the opposite. Any machines that can skin wheat are extremely destructive to the bran, as it needs friction surfaces at a destructive speed, or excessive rough surfaces or sharp edges to save pressure flouring the kernel. In fact, the miller's main object has been entirely mistaken by them. They seem to assume that it is the bran that has to be taken off the kernel so as to get them ground separate. Now, the miller's main object and difficulty is to get the flour detached from the bran. He knows the bran is always tougher than the kernel, and his object is always to keep on the borders of injurious pressure or crushing to avoid cutting the bran as much as possible. In short, he either crushes the flour entirely off by pure crushing, as some few Hungarian millers do, or, as nearly all millers do, he varies the cutting and crushing power so that the flour is torn off between the application of those two modes; and if some of the large flakes have the appearance of being rolled off, they are not so; it is simply the flour crushed, torn, or cut off; the bran being in all cases much the toughest, must be the largest.

[To be continued.]

PENNSYLVANIA MILLERS.

Third Semi-Annual Meeting.

The Pennsylvania State Millers' Association held their third semi-annual meeting January 12th, at the Stevens House, Lancaster. The meeting was called to order by President Chas. A. Miner, of Wilkesbarre. About 100 representatives of milling firms were present. Secretary A. Z. Schoch, of Selinsgrove, made his report, showing that 26 new members had been added since last meeting, making a total membership to date of 56. He deplored the apathy of millers in regard to joining the association; it was certainly to their interest to do so. Pennsylvania having more flour mills than any other State, should have the largest association. He thought that the prevalence of the opinion that the purposes of the association was solely for defense against patent right extortions was the cause of mil-

lers holding back. This he considered but a small portion of the uses of an association. He recommended that the association should pay the requisite admission fee and join the Millers' National Association. Thirty new members joined during the sitting of the association.

The Committee on Patents in their report also advised joining the National Association, and earnest efforts to increase the membership of their State Association. H. B. Horton of the Millers' National Insurance Company appeared and read a report of the condition of the company, which was endorsed by the Secretary. Mr. Thomas Wright, Chairman of the Committee on Mill Machinery and Processes, read his report, in which he stated that a machine capable of weighing and measuring grain in the running stream would be desirable if not complicated and costly, and desired inventors to give their attention to this matter. He said that American grain cleaning machinery surpassed all others, making special mention of the cleaning machines manufactured by Howes, Babcock & Co., of Silver Creek, N. Y.; Geo. W. McNeil & Sons, of Akron, Ohio, and others. He also recommended the Caldwell & Watson conveyor as possessing great merit. He said Pennsylvania millers generally used too much face and too little furrow surface on their burrs. The utmost care should be taken to keep the furrows and face perfectly smooth, and yet preserve the natural grit of the burrs. He advised the use of the cornudum or emery wheel for this purpose. For keeping the face perfectly true he recommended the use of a metal staff; advised also the use of rolls. He said that the time was not far distant when every miller would be obliged to use purifiers. The bolting apparatus should be so arranged that the product of each operation could be treated separately if desirable. In conclusion, he asked millers to make reports in writing at the next meeting of the processes and machinery in use in their mills.

Jacob Walters moved that the members of the association using middlings purifiers subscribe and pay \$10 per run to the National Association as an admission fee to that body. Carried. Fifty-two members present using purifiers answered to their names when the roll was called, and others signified their intention of paying if the National Association accepted their proposition. After considerable discussion the following resolution was passed:

Resolved, That this society will discourage the growing of Fulz and Clawson wheat. For milling purposes they are not desirable, and have been the cause of much of the complaint of our flour. We suggest Lancaster, old Mediterranean, Boughton, Shoemaker, Deal, Vick and Canada White be grown in preference.

In the course of the arguments on above resolution, A. C. Freck, of Millersburg, said that he had no difficulty in making good flour from Fulz wheat. He passed it through a Gratiot Heater, heating it to 98 degrees summer and winter before grinding. The moisture was thus taken out and light, clean, broad bran was taken out. He thought the Gratiot heater was the advantage which he and others had over those who did not use it. An election of officers was held and the present incumbents re-elected. The Secretary was voted \$100 yearly salary. Several gentlemen being present representing patented machinery were invited to exhibit and explain it, which they did. The meeting adjourned to meet again July 8th, 1879.

[The foregoing is a synopsis of the proceedings which is all that we are able to give on account of space. The report was delayed in coming to hand, and only reached us on the eve of going to press.]

GRATIOT'S WHEAT HEATER.

The following letter explains itself:

MINNEAPOLIS, Minn., Jan. 14th, 1879.—Messrs. Gratiot Bros., Platteville, Wis.—Gentlemen: We are conversant with the different kinds of steam wheat heaters on the market, and have no hesitancy in pronouncing yours the most simple, inexpensive and effective of any. Of late we tried a heater which seemed to promise some advantage over yours, but its use proved its uselessness, and yours had to be substituted. We cheerfully recommend your wheat heater to the public. Yours truly,

J. A. CHRISTIAN & CO.

Do you need a good Saw Gammer or Saw Tooth Saw? If so write to J. W. Mixer & Co., Templeton Mass. Agents wanted.

NOTICE.—Owing to the death of Mr. Edward Harrison, we take this method of informing you that the business will be continued until further notice, and that all orders will receive prompt attention. Letters should be directed to the "Estate of Edward Harrison," New Haven, Ct.

IMPORTANT NOTICE TO MILLERS.—The Richmond Mill Works and Richmond Mill Furnishing Works are wholly removed to Indianapolis, Ind., with all the former partners, tools, and machinery, and those of the firm who formerly built up and established the reputation of this house; therefore, to save delay or miscarriage, all letters intended for this concern should be addressed with care to Nordyke & Marmon Co., Indianapolis, Ind.

NOTICE.—The milling public are hereby notified that we have discontinued all suits against Messrs. E. P. Allis & Co., for infringements of patents on the Cookie Separator, manufactured by us, and the said firm of E. P. Allis & Co. will hereafter sell our machines on same terms as other mill furnishing, or the undersigned.

COOKIE SEPARATOR MFG. CO.

Milwaukee, Dec. 27th, 1878.

MILL PICK WORKS OF HENRY HERZER, No. 456 Canal street, Milwaukee, Wis.—To the Milling Public: Having this day dissolved partnership with the firm of H. & J. Herzner, I hereby respectfully announce that I have removed to No. 456 Canal street, where I am ready to receive orders for manufacturing and repairing mill picks, tools and all specialties in my line. My work is well-known through the country, and I do not hesitate to guarantee perfect satisfaction to all parties favoring me with their orders. Address

HENRY HERZER, No. 456 Canal street, Milwaukee, Wis.

OUR NEW JERSEY LETTER.

Milling Town in Jersey—Probability of a New Jersey Millers' Association—Important Mills—New Elevators Being Built—Prospect of the Trade, etc.

[Special Correspondence United States Miller.]

BURLINGTON, New Jersey, Jan. 18th, 1879.—The State of New Jersey, while being much smaller in dimensions than the two adjacent States, Pennsylvania and New York, is not very far behind her large sister States in the production of flour-making grains, and in the manufacture of flour itself. The principal wheat-raising sections of New Jersey are in Camden, Gloucester, Salem, Cumberland, Atlantic, Monmouth, Mercer, Burlington, Middlesex, Somerset, Union, Hunterdon, Warren, Sussex, Essex, Morris, Passaic and Hudson counties, while Mercer, Burlington, Camden, Somerset, Warren, Morris, Essex and Union counties is where the greatest portion of the flour that is produced in the State is manufactured, but hardly a county in the whole commonwealth has within its boundaries more or less extensively producing flour mills.

The flour manufacturing establishments of New Jersey have not, as yet, done much in the way of sending flour to the markets of the outside world, the millers contenting themselves with the small and sure profits that are always obtainable for a local trade in Jersey towns, but it is understood that several enterprising and wealthy Essex county millers contemplate the manufacture of "the staff of life" in immense quantities, with the object of exporting their product next spring or summer.

The Burlington, Trenton, New Brunswick,

manufacture of "Trenton crackers," which are celebrated all over the world for their excellence. Much flour from other parts of the country is likewise consumed in the manufacture of crackers. The Trenton flour mills, situated on the romantic and historical Assanpink Creek, are propelled by water power and old style machinery, but the spirit of enterprise is getting to be gradually infused into the milling business, and, estimating from current reports, THE UNITED STATES MILLER correspondent would not be the least bit surprised to learn of some wonderful revolutions in the processes employed in the manufacture of flour, and the method of handling and marketing it in Trenton, in the early future. If there was the same interest manifested in the making of "the staff of life," as there is in that of pottery, the great manufacturing municipality of Trenton would be one of the leading flour centers of the country.

While there is a want of activity among the flour factors, the railroad companies, whose lines of railroad gridiron the very heart of the grain-growing sections of the State, are busily engaged in the erection of grain elevators for the easy and rapid manipulation of the vast quantities of wheat, rye, oats and corn that is shipped on their lines, and which has to be changed to other methods of transportation upon its arrival at the docks of the companies at Jersey City, on the North River. Besides the floating elevators, the Starin Company has several great elevators of large capacity. The Pennsylvania railroad, the Delaware, Lackawanna & Western railroad, the New York Central railroad and Hudson River railroad all

back, but just what was needed, or what to do, to bring about the successful accomplishment of their idea, does not seem to have been thought of or mapped out in the minds of the slow-moving projectors. It has been left to a new comer, in the upper part of the State, to suggest the establishing of a Millers' Association similar to those that have existence in all the principal flour milling districts of the country. The suggestion appears to have been received with much favor by the leading millers of the State, and THE UNITED STATES MILLER correspondent, basing his belief upon the statements that have been made to him by prominent flour manufacturers in different parts of the State, during conversation in interviews upon the subject, thinks that a "New Jersey State Millers' Association" is among the possibilities of the near future. That such a movement may be inaugurated, and speedily perfected, is the earnest hope of all persons in any way interested in the flour interest of New Jersey.

Youngblood's Mill, at Hackettstown, is one of the famous institutions of that town, which is so replete with Revolutionary incidents. The mill has been doing an excellent business all winter, and the present prosperity is destined to be continued for a much longer period. If the rest of the Jersey millers were as enterprising as the people of Youngblood's old mill, they would soon have a rushing business, handsome bank accounts, and the establishment of a State Millers' Association would be a positive and established fact. However, THE UNITED STATES MILLER correspondent hopes, that by the next time he calls upon the

owns 25,000 acres of as good farming land as there is in the United States. The proposition of the managers of the association is to divide this land into small farms, so that they may be suitable for, and purchasable by, the laboring classes of small means. The working people who have hitherto been unable to buy farming property, in consequence of the prevailing high prices, have this opportunity afforded them of securing cheap and permanent homes. The lands are in a climate of a mean temperature of about sixty-eight degrees, ranging from thirty-six degrees in January to eighty-six degrees in August. The association's property, which is in a superior condition, is located in Northern Texas where stock of all kinds grazes all winter, and field work can be done at all seasons of the year. The lands are easily accessible by railroad communication, and the association will furnish free passes to actual settlers.

The National Farmers' Association should receive the support of all Americans who can understand and appreciate its usefulness, and who have a desire to hasten the development, prosperity and wealth of the country. The projectors of the organization (which is destined to become *National* in its scope and influence), desire to interest the attention of all the people of America in the enterprise, as it is of *National* importance and value, and correspondence, as to the association's plan of operations, is invited from all persons who take an interest in anything that pertains to the present and future welfare of the industrial affairs concerned. The office of the National Farmers' Association is at No. 7 Ex-



FIG. 2. INTERIOR VIEW OF THE GRINDING FLOOR OF THE MILWAUKEE MILLING CO.'S NEW MILL, MILWAUKEE, WIS.

Elizabeth, Newark and Jersey City millers have, for some time past, been considering the advisability of manufacturing flour for the export trade, and some of the manufacturers of those cities are now negotiating with parties in South America and European cities to accept consignments. It is believed the correspondence will result in the conclusion of satisfactory arrangements to the New Jersey millers.

A close survey of the general situation of the grain, and flour-making business, in New Jersey, finds it in a fair and comparatively profitable state. The grain growers are delighted with the excellent returns from their last year's crops, which were particularly good and abundant, and the opinion is general, on all sides, that, judging from the present outlook, the crops this year will be equally as fine, if not better, than those of 1878. The farmers of Burlington, Mercer, Hunterdon, Somerset, Warren, Sussex, Union, Essex and Morris, did particularly well with their grain crop last year, and much more ground will be used this year than last in the planting of wheat, rye, oats and corn, because the people are finding there products much more profitable to raise than "garden truck," which has always been cultivated in great quantities for the New York and Philadelphia markets.

Trenton, the capital of the State, and one of the chief manufacturing centers of the country, has a number of large and heavily producing flour mills, but the product of these establishments mostly finds its way into the

have elevators of immense elevating capacity. Now, the Erie railway (which is now called the New York, Lake Erie & Western railroad), whose managers will never allow themselves to be outstripped in the game of enterprise, is soon to have a new grain elevator, and extensive store-houses for the holding of grain in bulk. These buildings are to be erected on the Hoboken basin, in Jersey City. It is the purpose of the company to have the elevator completed in the coming summer. The contract for the work has not been signed yet, but Vice-President Blanchard says that it is closed.

The elevator will have a capacity of 1,000,000 bushels of grain. It will be on one side of the basin, and the store-houses on the other. These improvements will largely increase the facilities of the road for moving grain. The Philadelphia & Reading railroad, in conjunction with the North Pennsylvania and Baltimore & Ohio railroads, also contemplates the erection of a great grain elevator at Port Richmond, on the Delaware River. The Pennsylvania Railway Company has one of the largest elevators in the country, and the quantity of grain (which mostly comes from the West) handled daily, is actually immense.

I had almost overlooked the fact, in writing this correspondence, that some of the New Jersey farmers have conceived the idea of starting a Millers' Association. The idea is not an entirely new one, for the millers have been thinking that some interchange of opinion, and co-operation of interests among them, would be a very good thing, for some years

New Jersey millers that they will have advanced to a position of prominence in the flour exporting trade, that their State Association will be a thing of life, and everything else will be in apple-pie order and operating flourishly.

THE NATIONAL FARMERS' ASSOCIATION.

An association under the above name has been organized in Boston, Mass. The object of the organization, which is set forth in article fourth of the constitution, is as follows: "The object of this association shall be to encourage emigration to, and settlements upon, railroad, national, State, and other lands, that the farming, agricultural and horticultural interests of the country may be promoted, the wealth of the nation increased, and the laboring classes benefited."

The capital stock of this association, covering its first purchase of twenty sections of subsidy railroad lands, at the State price of \$1.50 per acre, having been all subscribed, and the purchases having been duplicated, the books are now open for subscriptions to the second twenty sections. The minimum price is soon to be fixed at three dollars per acre, and upwards, according to its proximity to railroad depots and town sites. As these purchases were made by the association before the advance in the price of land was decided upon, the benefit arising therefrom will accrue to the stockholders of the association in proportion to the stock owned by each.

The association has purchased and now

change Place, room 5, Boston, Mass., and the President, I. W. Alden, or Secretary, I. P. Snow, will furnish all information that may be requested by inquirers. Success to the National Farmers' Association, and all similar organizations, as they improve and enlarge our great *National* resources, and are of incalculable advantage, value and benefit to our people.

W. A. E.

Cut This Out.

"United States Miller" Subscription Blank.

We hope the milling friends of the UNITED STATES MILLER will be as liberal to it as it has been in the past, and will be toward them in the future. Subscription price, one year \$1, or two years and a half \$2. We shall be pleased to have an early response to this. Fill out the blank below, enclose with money in an envelope, seal carefully and send at our risk. A receipt will be sent by return mail.

Address all communications to the
UNITED STATES MILLER,
Milwaukee, Wis.

Editor of the UNITED STATES MILLER, Milwaukee, Wis.—Sir: Send one copy of the United States Miller for _____ year _____ for which find enclosed \$_____.

Name _____
Post-Office _____
County _____
State _____

UNITED STATES MILLER.

E. HARRISON CAWKER, EDITOR.

PUBLISHED MONTHLY.

OFFICE, 62 GRAND OPERA HOUSE, MILWAUKEE, WIS.
 Subscription Price..... \$1 per year in advance
 Foreign Subscription..... \$1.50, or 6s. per year in advance
 All Drafts and Post-Office Money Orders must be made payable to E. Harrison Cawker.
 Bills for advertising will be sent monthly unless otherwise agreed upon.

MILWAUKEE, FEBRUARY, 1879.

We send out monthly a large number of sample copies of THE UNITED STATES MILLER to millers who are not subscribers. We wish them to consider the receipt of a sample copy as a cordial invitation to them to become regular subscribers. We are working our best for the milling interest of this country, and we think it no more than fair that our milling friends should help the cause along by liberal subscriptions. Send us One Dollar in money or stamps, and we will send THE MILLER to you for one year.

THE UNITED STATES MILLER has now entered upon its sixth volume, and has become universally acknowledged to be one of the most valuable milling journals in America, both for the purpose of transmitting knowledge on milling and mechanical subjects and as an advertising medium for introducing and selling all kinds of modern milling machinery. It is our aim to meet the wants of our patrons, whether manufacturers or consumers. Our editorial course will be entirely independent, and we shall do our best to give our readers the benefit of the latest important news on subjects pertaining to the objects of this paper. Our circulation and advertising patronage cover all sections of the country. We do not deal in machinery ourselves, and consequently have no "axes to grind." We cordially invite all those who have already patronized us to continue their patronage, and those who have not to try our columns. We append herewith our

ADVERTISING RATES FOR 1879.

	1 mo.	2 mos.	3 mos.	6 mos.	1 year.
One inch card	\$2 00	\$4 00	\$5 50	\$10 00	\$20 00
Two " "	4 00	8 00	11 00	20 00	40 00
Four " "	8 00	12 00	16 50	30 00	60 00
One-half col. 6 inches..	10 00	20 00	30 00	60 00	100 00
One-fourth page	20 00	40 00	60 00	120 00	200 00
One-half page	40 00	80 00	120 00	200 00	400 00
One page	100 00	150 00	200 00	400 00	800 00

Size of page, 12x18. Length of column, 16 inches. Width of column, 2½ inches; 4 columns to each page.

Business editorial matter per line, 30 cents. If over 50 lines, 25 cents.

Illustrations charged for in proportion to space occupied.

Advertising for Millers wishing situations, or millers wanting to engage employees, 50 cents.

MILL FOR SALE advertisements, 92 each insertion.

We have recently published a List of Names and Post-Office Addresses of the Flour-Mill Owners of the United States and Canada, which is of great value to those who desire to communicate by circular with American mill-owners. The price is \$5 per copy, post paid. Cash must accompany the order.

We have also lately published a Saw and Planing Mill Directory of the United States and Canada. Price, \$5.

Subscription price to the UNITED STATES MILLER, \$1 per year.

M'Lean's Millers' Text Book, which every miller should have. Price by mail, 60 cents, post paid.

Ropp's Easy Calculator, which every business man should have in his pocket or on his desk. Price by mail, post paid, \$1.

Our Job Printing Department is one of the finest in the State, and particular attention is paid to all kinds of commercial work, which we can do on the most reasonable terms. Parties desiring to publish catalogues, circulars, etc., should send for estimates.

Address all communications to the

UNITED STATES MILLER,
62 Grand Opera House, Milwaukee, Wis.

THERE were 101 patents granted to Thos. Edison from Jan. 1st, 1872, to Jan. 1st, 1878.

THERE were eighty-seven mills burned in the United States during the year 1878. Eight of these were in Minneapolis, Minn.

THE Western Shoe and Leather Review, of Chicago, is doing good work in opposing convict labor in shoe making.

A FRENCHMAN has invented an electric process that he claims will do away with the work of the engraver. Verily this is an age of progress.

THE Washington Review concludes an editorial by saying: "Mr. Postmaster General, lend us your ear." We would amend by saying lend us your stamps.

LAWRENCE KLEMM, of Terre Haute, Ind., is the latest inventor of an improved apparatus for cleaning middlings by means of a force and suction draught.

A VALUABLE manual for engineers and steam users' use by John W. Hill, M. E., can be had by sending address and ten cents in postage stamps to Wm. A. Harris, Providence, R. I.

DURING eleven months of the past year, the receipts of grain at the Atlantic ports have been 285,071,618 bushels, which is more than 50 per cent greater than those of any previous year, the largest previous receipts for any one

year being 154,932,011 in 1876. The West has an interest in these figures, the great bulk of this grain having been shipped from this region.

THE wheat receipts in Milwaukee during the year 1878 were 21,000,913 bushels; flour, 2,265,931 barrels. The shipments of wheat were 17,037,807 bushels; of flour, 2,620,588 barrels.

THE Cincinnati Miller and Millwright for January comes out in new type and is printed on handsome paper. Happy New Year and success to the Miller and Millwright for 1879, say we.

WE call attention to the change in the advertisement of Messrs Howes, Babcock & Co., of Silver Creek, N. Y. It will be seen that they offer very favorable terms to purchasers of their well-known wheat cleaning machinery.

ONE thousand laths will cover seventy yards of surface.—Ec.

Fact, and the surface might be twice as great and still be dissatisfied if the lath were applied in the good old-fashioned way well known to all the boys.

MESSRS. Collins & Gathmann, of Chicago, Ill., manufacturers of the Garden City Middlings Purifier, are crowded with orders for their machines. Orders come from all points of the compass. Their machine is a good one, and millers have found it out.

JAN. 24th we had the pleasure of a call from our friend R. L. Downton. He is looking wonderfully well, fat and hearty. He informs us that the taking of testimony in the Roller case has been closed and his case will soon be adjudicated. M. Downton was on his way to St. Louis from New York.

TEN years ago Russia and the United States stood on nearly an even footing as regarding grain shipments to England. Then Russia shipped to England 10,719,000 centals and America 10,594,000 centals. Now America has shipped during the last year 48,169,000 centals while Russia has shipped only 11,169,000 centals.

MESSRS. Hulbert & Paige, the well-known mill furnishers, of Painesville, Ohio, have opened a branch house for the accommodation of their growing Western trade. We are glad to note this thrift in their business. All communications for their Western department should be addressed to Messrs. Hulbert & Paige, P. O. box 2,026, Kansas City, Mo.

AMONG the January shipments of the Milwaukee Middlings Millstone Company, was one 24-inch mill for the Los Gatos Manufacturing Company, of Los Gatos, Cal., and one 24-inch mill for M. G. Gordon, of Los Vegas, New Mexico. The mills manufactured by this company give absolute satisfaction wherever used. In construction and finish they are models of perfection.

A CORRESPONDENT writes to the Scientific American suggesting that some one get up a portable hand loom for the market. He thinks the demand would be good. Amateur lathes, fret saws, drills, printing presses, etc., are already abundant. We would also make a suggestion: Let some one invent a little pocket flour mill. When this is done, he that runs may grind.

DAN. TALMAGE'S SONS & CO., the great New Orleans rice dealers, send us the present quotation of this cereal, as follows:

Broken, per lb.	3@4c
Common, per lb.	5@5c
Fair, per lb.	5@5c
Good, per lb.	5@6c
Prime, per lb.	6@6c
Choice, per lb.	6@6c

THE Miller takes much pleasure in saying that Mr. A. L. Clarke, late of Milwaukee, Wis., has pitched his tent in St. Louis for the future. He may be found at the office of this paper by his Northwestern and other friends hereafter.—St. Louis Miller.

Yes, that's so; but there is a load-stone here that will continue to draw Al. to Milwaukee pretty often unless said loadstone makes him everlasting happy by moving to St. Louis. Send us a piece of cake, Al., when that good time comes.

THE Cincinnati Chamber of Commerce, which includes a membership of 1,200 of the wealthiest citizens, having hired quarters for its accommodation for several years, now propose to build an Exchange of its own. A lot 160 feet front and 100 feet deep has been

secured at a cost of \$140,000, and the proposed building will be six stories high, and cost \$160,000, making the total expense \$300,000. The association has now a surplus of \$40,000, and it is proposed to raise the remaining sum by requiring every member to take one share of the stock, and to issue bonds at 7 per cent. for whatever remains.

HOPPIN, of the Northwestern Miller, in his last number gets off a good joke at our expense. We set 'em up, on the occasion referred to, and everybody from landlord Becker down to the boy that digs the fish-bait declared he wouldn't give it away. Delafield, Wis., is really one of the nicest, cosiest places we know of in the country to enjoy fishing and fun in general, and if Hoppin will join us next summer on an excursion we will get landlord Becker to tell his fish story which discounts all the yarns about fishing yet told.

THE ENGLISH ROLLER PATENT CASE—WEGMANN VS. CORCORAN, WITT & CO.—The above entitled action has recently been brought to a close in England. The Court held that the invention was not set forth in the specification of the patent with sufficient clearness to enable an ordinary skilled workman to construct the machine specified, and therefore found for the defendants. Mr. Wegmann has filed an appeal and the case will be carried up for further argument. The question of the real merits and value of the invention were scarcely considered. The proceedings were very lengthy, and have attracted great attention in English milling circles.

THE Maciato or Italian grist tax is two centimes per kilogram on wheat, and one centime on Indian corn; that is, about 2½ of a cent to 2½ pounds of wheat or 1½ of a cent to 2½ pounds of corn. In the cities and towns this falls hardest on the laboring classes. In the country, though bread forms a portion of the dietary, it is not the main constituent. In Tuscany, kidney beans supply the use of flour, but in Upper Italy polenta made of Indian corn is the main article of diet. This tax, in a family of ten consuming wheat and Indian corn, produces 19 shillings of taxation annually, or between four or five dollars in United States money.

A DISCOURAGED MILLER.—Among our sample copies of papers sent out last month we sent one to a miller "way down in Jersey." He writes us as follows:

Editor United States Miller—DEAR SIR: I must decline taking your valuable paper, as I feel that I am too old to enter upon the great work now of modern milling. I have a good old-fashioned mill that I have run for over 30 years, and it grinds quite well. I have been much exposed to cold and wet in my time, and seriously afflicted with rheumatism, which with my years pretty well subdues the energy I once had. I believe your journal is well worth the attention of all millers of the rising generation, but when I look at the changes which have taken place in milling in the last decade of years I confess I feel discouraged at the task of undertaking the making of the great changes now considered necessary for good milling. While I yet linger in the land of the living I shall try and be content to watch the old wheel go 'round and 'round, and turn out my grists in the old-fashioned way. Wishing your journal prosperity, I have the honor to be,

GEORGE A. M.—

WIRE-BOUND WHEAT.—A simple and ingenious invention does away at once with all the trouble experienced with wheat bound with wire, and the merits of the wire-binder will long be enjoyed by the farmers. The invention consists simply in placing a row of ordinary horseshoe magnets at any place on the wheat-cleaning machinery where the wheat passes in a thin stream, and whenever a piece of wire comes along it is immediately drawn to the magnets. Occasionally these pieces of wire should be scraped off from the magnets. Wherever this is done there need be no complaint of wire in wheat. The invention, we believe, is not patented. J. T. Graham, of Rickford, Iowa, has also discovered a remedy and writes to the N. W. Miller as follows:

I have made a discovery which will interest every miller. Not wishing to get a patent or to let others have the chance, I wish you to publish this in your paper. My discovery relates to taking out all the bits of wire from the wire-binders before the wheat goes to the stones. It is done the same way that we used to take out gold in California. Just make little ruffles on the sieves straight up and down on the upper side and it will catch them all.

Senator Thatcher has introduced a bill in the State Legislature to "ascertain the true grade of wheat." It is proposed to abolish the "little brass tester" about which so much has been said.

GEO. R. GALE, CLEVELAND, OHIO.

On passing through Cleveland, Ohio, a short time since, we called at the establishment of Mr. Geo. R. Gale, known as "The Hayward Mill Furnishing Works," one of the oldest mill houses in this country, having been established in 1824, by the Hayward Bros., and the activity here shows that Mr. Gale must be fully sustaining the wide reputation earned by the house for supplying the best quality of French burrs. There were a large number of men employed building stone, and we found he had orders from all parts of the country. Every stone sold here is built under the personal supervision of a man of long experience, and no cheap built stone or inferior material allowed to go from his establishment. Among late sales were three pair for the mill of I. N. Dixie & Co., of Massillon, Ohio; one pair for M. F. Schumacher, Aron, Ohio; one pair for Fish, Storm & Davis, Shelby, Ohio, and many others throughout the country, while he has been sending cloths almost everywhere. Millers soon find out where they can buy the best quality of cloth—and Mr. Gale handles only the celebrated cloth made by Du Four & Co., and H. Bodmer, so that he never fails of suiting those who favor him with an order. He says if he has an opportunity of sending a cloth to a mill once, that there is no trouble after that, as the millers are sure to send again. Besides he is selling a large amount of mill machinery, such as smut mills, middlings purifiers and portable mills.

IOWA MILLERS' ASSOCIATION.

Fifth Annual Meeting

The fifth annual meeting of the Iowa Millers' Association was called to order at 11 A. M., in the Council room, at the city of Des Moines, on January 15th, by President J. J. Snouffer, of Cedar Rapids, and at once proceeded to business.

The minutes of the last—the semi-annual meeting held at Oskaloosa—were read and approved.

The calling of the roll of members was dispensed with.

On motion, Wm. Milligan, of St. Louis, was elected an honorary member of the association.

On motion, the following named gentlemen were elected members of the association: Replogle & Brown, Farragut Iowa; Consigney, Worth & Kinney, Avoca, Iowa; Henry White, Voigt City, Iowa; upon signing the constitution and paying the membership fee.

The report of the Secretary and Treasurer of the association was then read and approved. This report showed that sixteen new members had joined the association during the past year.

On motion, Mr. J. G. Sharp, Mr. R. Nicholson, and Mr. C. A. Bryan were appointed a committee to investigate the financial condition of the association and report the amount of assessment necessary to carry the association through the year 1879.

The report of the committees appointed at the last meeting were then called for. The first being upon our present Constitution and By-Laws, to report any changes that may seem to them advisable. Chairman J. R. Serrin of that committee, submitted a lengthy report, which after due discussion was adopted.

The committee appointed to investigate the financial condition of the association, reported as follows:

Mr. PRESIDENT: Your committee to whom was referred the matter of assessment to meet the necessary expenses of the association, would report that \$1.00 for each member will be sufficient at this time, there being now in the treasury \$20.14 and \$6.50 yet due on last two assessments, part of which may be collected.

J. G. SHARP.

C. A. BRYAN.

ROBT. NICHOLSON.

Adopted, and assessment ordered to be made. The committees upon flour dust explosion, and upon the best varieties of wheat for milling purposes, made no report.

The association then proceeded to the election of officers for the ensuing year, resulting in the election of—

President—J. J. Snouffer, of Cedar Rapids. Vice-President—J. Jones, Algona.

Secretary and Treasurer—J. H. Reed, Boone.

Executive Committee—D. B. Knight, Boone; J. R. Serrin, Ladora; S. D. Nichols, Panora.

Upon motion it was resolved that a vote of thanks be tendered the city of Des Moines for the use of the City Council rooms.

Adjourned to meet in the evening at Aborn House.

Meeting called to order at 11:30 P. M. in the parlor of the Aborn House and immediately adjourned to meet at Marshalltown, Iowa, on the second Wednesday in June, A. D. 1879.

J. H. REED, Sec'y.

IMPROVED MILLING AND METHODS.

A Valuable Paper Read Before the Indiana
Millers' Association, Dec. 12th, 1878.

BY JOSEPH F. GENT.

To the President and Members of the Indiana
Millers' Association:

GENTLEMEN: It again becomes my duty, as Chairman of the Committee on Mill Machinery and Methods, to submit to you for your consideration a few thoughts on the subject of Improved Milling and Methods, which, at present, seem to occupy the minds of that class of millers who believe, as I do, that milling, or more properly the manufacture of flour in the United States, is destined to become one among the greatest interests of our country, and who are striving, by every available means at their command, to improve the products of their mills in yield, strength and color.

The first thing to be looked after in the mill is the yield, not only the amount of flour made from a bushel of wheat, but in mills where more than one grade of flour are taken off, the percentage of each grade so taken becomes a matter of as much importance as that of the total yield per bushel.

This point settled, the strength and color are the qualities which alone must make for the brand or grade its reputation, and establish its value in the different markets where it is offered for sale.

We were told, a few years ago, that strength and color could not go together, and I am sorry to say there are some millers yet who, if shown a very white sample of flour, will doubt its strength. This notion was no doubt derived from the fact that, under the old process of grinding, flour which was ground high and on a sharp stone, and bolted in the ordinary way on a coarse cloth, seemed to have more strength than that which had been ground on a dull or smooth stone, and heated sufficiently in the operation until all the gluten was destroyed, but the latter had the best color, hence the conclusion among millers that white flour does not possess sufficient strength. This, like other false theories, is fast being laid aside, as new and improved methods are being introduced.

There is at least one miller yet living who, if a resident of New York, would be prosecuted for cruelty to animals; I refer to the gentleman who, at the last meeting of the Michigan Association, said he did not believe there had been any improvement in milling by the adoption of the new process of making flour—that they made just as good flour 25 years ago as now.

There seems to be an impression among millers that to pulverize the flour too fine destroys its strength. This may be true of hard spring wheat, for in order to pulverize it to the same degree of fineness as winter wheat, by the same methods, it being harder, more heat would be generated, and consequently the greater liability to injury by too close grinding, and from the reasoning we are able to account for the fact of millers in sampling flour feeling the grain of the flour and choosing the coarsest samples as the best. From my experience I am thoroughly convinced that it would be impossible to reduce it to such a degree of fineness, by the ordinary methods of pulverizing, as to injure its strength, provided the temperature was not raised too high by the process by which it was reduced.

The temperature should, I think, be increased as little as possible by the process of grinding, and the bolting should be performed as nearly as possible at 65 to 70 degrees. This however, in many mills, can not be regulated. Any mill so situated or constructed that the temperature can not be brought up in winter or cold weather, can not produce an even grade of flour, no matter what their facilities may be for controlling the process of bolting.

Grinding, granulating, or pulverizing wheat for the purpose of producing flour, middlings and offal, is a subject which requires great study and the exercise of our best judgment. To grind well is the grandest accomplishment a miller can possess, for in this he is called upon to decide some very close questions. I am well satisfied that no miller can grind high and grind correctly, with different varieties of wheat, by simply feeling the chop as it comes from the stone, and in most cases if you venture to express a doubt upon the matter, you are told by the miller that he grinds by the offal. If this is correct, just imagine yourself seated in the bran bin, trying to determine which stone was doing the bad grinding, two or three stories below, having worn your fingers to the quick setting and regulating the stone, before entering upon this last and final test. If you are asked to examine a sample of bran, and decide whether it is sufficiently

scoured and free from flour, do you pour it through a spout with one hand, close your eyes, and feel of it with the other? No, you first look at it closely, then measure and weigh it. Yet, you could as readily determine whether or not the sample of bran was well cleaned by feeling, as you could whether a stone was doing perfect grinding by the same method, when grinding as high as is necessary to make first-class work.

Let us do away with all such imperfect and impractical methods, and procure an accurate pair of scales and a set of small sieves, clothed with proper cloths, take them into the mill, and weigh exactly one pound of chop from each run of burrs, and separate it by means of the sieves, and figure out the percentage of each part; by this means we can readily determine which stone in the mill is doing the bad grinding, and introduce the proper remedy at once. This method once adopted in the mills in Indiana, and our flour will gain a reputation for evenness, strength and color, never before thought of.

My word for it, gentlemen, you may introduce new machinery and new processes without number, but unless the grinding and bolting is thoroughly and systematically done the new machinery will amount to nothing.

There is one matter of which I desire to speak—that of driving stone by means of a loose spindle and self-adjusting driving-irons. I look forward to the time when the running stone will no longer be allowed to swing at random over the bed-stone, but will be rigidly fastened to the spindle and put in perfect trim with the bed-stone before starting, and so arranged as to be kept so. Then, in my opinion, we will have approached perfect granulation.

By the old process of low grinding, where the running stone was expected to lay on the grain with its full weight, or nearly so, it was then, perhaps, necessary for the runner to have the means of adjusting itself to the bed, in order that the whole of the kernel might be as nearly as possible pulverized to the proper fineness at the first grinding, which, however, seems to my mind so clearly an error that it is unnecessary for me to produce any argument in favor of the stiff spindle.

But, while speaking on that subject, I will simply mention one or two instances where they have been successfully used for purposes identical in their nature to that of the granulation of wheat for the purpose of making middlings. For instance, a stone hung on the spindle in the ordinary way, nicely adjusted and balanced, was tried for the purpose of hulling oats before being made into oatmeal, but was pronounced a failure, thrown aside, and new machinery introduced. But after trying the new methods the stone was again taken up, mounted on a stiff spindle and found to be far superior to anything else for hulling oats, preparatory to making oatmeal. The same may be said of stone used for hulling barley; also stones used in some mills for the purpose of treating wheat before grinding, called ending stones. They were of necessity mounted on stiff spindles, because those hung on loose bails ground a part too fine, while a part was allowed to escape untouched.

I am so thoroughly convinced of the correctness of this theory, that should we build a new mill, which we expect to do, I should adopt them for all purposes, wheat and middlings. I should, however, put in a different dress to that now used in most mills. As a general thing I am of opinion that most mills, milling soft winter wheat, are using too much grinding surface; there does not seem to be any one dress that will exactly suit the wheat grown in any two sections, where there is any very material change in the climate, or where different qualities of wheat are grown. But my experience with hard Mediterranean and some of the softer qualities of winter wheat, such as white bearded, gipsey, and other smooth wheats raised in this State, has proven to me very clearly that there is one rule which may be universally adopted by millers, namely, the softer the wheat the less surface required on the face of the stone to granulate it. And I find, by reducing the grinding surface, the same proportion of middlings may be obtained from the softer varieties of wheat that can be had from the Mediterranean; but the flour does not seem to have the same strength as that made from hard wheat middlings.

I shall now speak of the process of bolting, and the purification of middlings. There is the same lack of system in bolting that is found on the grinding floor of many good mills; I think partly owing to the system followed by many millwrights and mill furnishing houses. When the millwright or mill furnishing house is called upon and consulted about building a mill, they talk of the number

of stone the party wants—3, 4, 5 or 6 run; one smut mill, one flour packer, one middlings purifier, and four to six reels, for bolting purposes, with one or one and a half conveyors under each. They get them together, send them out and put them up, and have the audacity to call this a new process mill, while in reality they are simply making the coffin and digging the financial grave of their customer, who loses his money and sells out at a discount, disgusted with the business. I do not say this to injure any millwright or mill furnishing establishment, but I say it in the interest of the millers of Indiana.

I do not desire to be understood that a small mill cannot be built to make new process flour, but if a small mill is to be built, put in just the number of stone to do the work properly and in proportion to a large mill doing first-class work. By building the mill right, with the proper number of stone, custom work can be done and one dollar more per barrel can be had for all the flour made by the mill and sold on the market. It is a mistaken idea that if a small mill is built it cannot do good work—it can, and should make the very best of flour, provided the wheat is of good quality. But to do this it must have, first, sufficient bolting surface to bolt out all the clear flour made by the first grinding; second, sufficient bolting capacity to rebolt all the returns and dustings from middlings; third, sufficient bolting capacity to bolt out all the flour from the ground middlings; fourth, sufficient bolting capacity to dust and rebolt dustings from second middlings; fifth, sufficient bolting capacity to bolt out all the flour from reground bran, and separate any fine middlings from it, if any should result from each bolting and grinding; sixth, at least one set of rolls and sufficient bolt to bolt and separate their products. This any mill must have to do good work. No less will accomplish the work. And my advice to you who contemplate building or refitting, do not allow any man to build it for you, unless the performance of these several separations are expressly stipulated in the contract. Then, if you cannot place these several parts together, so as to make a mill out of them as herein described, each in its regular order, then you should consult some one who can arrange them for you, and that man is the one who should build your mill. Where you buy your machinery is a matter of little importance, so the best is selected. And finally, I will say, that unless the same system is carried out in bolting, as is done in grinding, but little will be accomplished.

I shall now speak of the separation and purification of middlings. Middlings, in my opinion, should be separated or graded by means of bolts for that purpose, clothed with suitable cloth, and two sizes or grades thrown on to machine No. 1; two grades on machine No. 2; two grades on machine No. 3, and two grades on machine No. 4. The head of each of these machines may be taken for clean middlings. The middle of the two first machines should be put on machine No. 5, and the middle of machines Nos. 3 and 4 should go on machine No. 6.

Now throw the tail and cut-off from machine No. 1 on the head of machine No. 2, and the tail and cut-off from machine No. 2 on the head of machine No. 3, and the tailings and cut-off from machine No. 3 on the head of No. 4, and the cut-off and tailings from machine No. 4 to rolls.

Now take the cut-off from machine No. 5 and throw it back on machine No. 2, and the cut-off from machine No. 6, to the head of machine No. 4; the tail of machines Nos. 5 and 6 to roll with tailings from No. 4.

In my report last spring I expressed myself in favor of purifiers using a blast, or blast and suction combined, and my experience with blast machines since that time has confirmed my opinion as then expressed. I am of the opinion that a machine using both blast and suction, so combined as to throw the middlings on the machine in such a manner that the blast would raise the whole body of middlings in a chamber, and allow the suction to carry away all the soft, fuzzy matter from the middlings, before they come in contact with sieve, thus having them free and round and in such a condition that a suction could have free passage up through the sieve and the middlings thereon, thus carrying away any remaining portions of foreign matter, or keeping it on top of the middlings, and passing it over the tail and away from the machine, would clean middlings with much less waste than any suction machine.

I have been a close observer in this matter of cleaning middlings, and I have invariably found that wherever the cloth is covered with middlings on a suction machine, as is always

the case at the head of the machine, the middlings are not properly cleaned. The reason of this, I think, is plain. The fiber and fluff not being previously removed by means of the combined blast and suction applied before the middlings fall on the cloth, clog the meshes of the cloth as well as the small openings between the particles of middlings, thus allowing the middlings to fall through the cloth, and beyond the control of the suction, without being thoroughly cleaned.

I present these thoughts, gentlemen, not that you shall accept them as facts beyond dispute, but for your consideration, and ask that all of you give your views and experience upon the ideas and suggestions presented, and I hope that as many of you as can spare the time will be prepared to read an article on milling at our annual meeting in June next.

SENATOR DAVIS ON PATENTS.

Senator Davis of this State is not much given to speech-making, especially on strictly political questions. During the ante-holiday session he was entirely silent on the subjects which drew party lines. He had something to say, however, about the patent system in connection with a bill introduced by the Committee on Patents. He is peculiarly competent to discuss that subject intelligently and fairly. As a member of the Supreme bench of the United States for quite a number of years, he had frequent occasion to sit in judgment upon litigation growing out of infringements of patent rights. A large per cent of the business in the Federal Courts relates to patents. No other member of either house of Congress has had so thorough a training in that line as Judge Davis, or is entitled to so much consideration in the discussion of the question of patent-law reform.

The advantage to the country from the patent system is great beyond all calculation. The superiority of American machinery, as compared with that of any other country in the world, is largely due to the protection afforded to invention. Ingenuity is encouraged and stimulated. But there are evils of a great magnitude incident to the system, evils so great as to seem almost overshadowing. Monopolies growing out of it lay heavy burdens upon production. Often, if not generally, the advantages of the patent inure to the benefit of some one besides the patentee. Many a man has become rich out of the invention of another who remained poor. Then, too, where patents affect large interests which can easily combine, their concentrated power is sufficient, as Judge Davis remarks, to ruin any patentee who attempts to bring them to account for infringement. The weak are nowhere more at the mercy of the strong than in patents. Judge Davis conceded that the general purport of the pending bill is well calculated to counteract, as far as they can be counteracted, the evils of monopoly. But he suggested several amendments. The most important part of his speech is the position that the difficulty in reaching fairly and fully the evils of infringement and monopoly could be best met as follows:

In taking an account of profits for the use of an invention secured by a patent where the patentee or his assignee shall elect to demand profits, the whole, or such portion of the actual profit or saving derived from such use, shall be allowed to the patentee or his assignee, as the Court may deem just in order to secure a fair compensation for such use, having regard to what would be a fair royalty therefor in view of the skill exhibited in making such invention and the value thereof to the parties using the same and to all circumstances of the case; and the master, in taking and stating such account, after stating the amount of profit or saving actually made by such use, shall give and state what portion thereof would, in his judgment, be such fair compensation as aforesaid, to be subject, however, to the modification and judgment of the Court; but when a patentee or his assignee shall elect to demand an account of profits against any person for an infringement of his patent, he shall not be entitled to recover damages for the same infringement.

Every farmer, every mechanic, and all industry down to the laundry, is interested in this matter. Judge Davis shows his great common sense in the foregoing suggestions. This Congress ought not to expire without securing patent reform. The Senate has shown an earnest disposition, and will probably do something. The danger is that the House will be manipulated by the monopolists, and actual results be defeated thereby.—*Chicago Evening Journal.*

It is the surprises of life that add most to our pleasures; one man is surprised with a legacy from a rich uncle, another that the old speckled hen has just cum off the nest, with 27 chickens.

THE IRON TRADE.

INTERESTING LETTER FROM PENNSYLVANIA.

[Special Correspondence United States Miller.]

BETHLEHEM, Pa., Jan. 1st, 1879.—The extent to which the iron industry of the country is now, or is likely to be hereafter, relieved by the export of any of its products is a question to which the associated industries of the United States has for some time past given close attention. With the view of obtaining a definite and authoritative answer, the Secretary, Mr. Lorin Blodget, has made a personal inquiry among a large proportion of the manufacturers of minor articles of iron, and he has now presented his conclusions, in the form of a report, to the American Iron and Steel Association. Mr. Blodget declares that the development of the export trade in iron articles is of the most striking and remarkable character, and that it already represents fully one-fourth, and in some instances as high as three-fourths, of the entire product of the Philadelphia manufacturing establishments.

These conclusions are also fully verified by the statements in the report. Three local houses engaged in the manufacture of steel forks, hoes and rakes have been compelled of late to increase their working force, and three-fourths of their productions have been taken up in England and Central Europe. A large demand for their articles has come from Sheffield, and English manufacturers are exporting them to the colonies as English wares. Five establishments are full with foreign orders for steel and iron tools, while six others are exporting shovels, spades and coal hods to Europe, South America and Australia. One local firm has made a fair commencement in the way of exporting table cutlery. Diston's saws, files and levels are being made to order from every part of the world, and three other establishments are doing a large foreign trade in the same class of articles. Nails and spikes are being taken in liberal quantities for South America and the West Indies, and this trade, according to the reports received by the manufacturers, is capable of very considerable extension.

The closing months of the year 1878 has developed an export demand for bolts, nuts and rivets. Six establishments have received large orders for England, the Continent, Australia and South America, and the whole are actively employed. Several iron mills outside of the city of Philadelphia have sent large quantities of fencing and other iron to Brazil, the River Plate and Australia, and an order for a system of suspension bridges in Peru is anticipated by a Pennsylvania firm some time this month. Several large orders from Peru and Chili for sheet and roofing iron have been filled, and a practicable opening exists for competition with England in the supply of the enormous quantity of galvanized and other sheet iron constantly required in South America. Foreign orders for merchant bar iron have recently appeared in the market for the first time, and two shipments have been made to Callao. Twelve establishments are receiving frequent foreign orders for galvanized pipes, railings, fences and cemetery inclosures.

The export trade in hardware has of late advanced in a most remarkable manner, and the business is already assuming enormous proportions. The largest demand is from England, and the next from Germany, while Australia and South America are calling directly for quantities never until recently thought possible to be sent out. Brass work and castings have participated in the export movement to England, the Continent and Australia, the more novel and elaborate forms in plumbing and gas and water supplies being especially in demand.

In addition to these articles Mr. Blodget gives a list of manufacturers who are filling foreign orders for railroad supplies and machinery, sugar machinery, agricultural implements, mining shaftings, and last, but not least by any means, grain and flour mills. Altogether not less than two hundred local establishments are engaged on orders for foreign markets. Many of these have their whole working force employed in this direction, and are compelled to refuse home orders. A list of the various classes of iron and steel goods for which a market exists outside of the United States would fill a page of THE MILLER.

A tour of inspection along the Lehigh, Schuylkill, Susquehanna, Wyoming and Lackawanna valleys by the UNITED STATES MILLER correspondent, shows the great and important iron manufacturing industries to be enjoying a degree of prosperity that has not been noticeable in the business for a long time. From here to Easton in a southeastern direction, and

to Mauch Chunk—the entry of the Lehigh coal region—in a northern direction, is where is located the extensive iron producing country of Northern Pennsylvania, and in this district reside many of the iron kings of the State. To ascertain the state of the interest the correspondent of the UNITED STATES MILLER interviewed one of the millionaire iron masters, and this is what he said, with an energy that exhibited his enthusiasm and pleasure about the subject:

"Well, Mr. correspondent of the UNITED STATES MILLER, at no time since the panic of 1873 have the prospects been as bright for a general revival of business. I think we iron masters can resume now with some chance of making a little money. The sheet iron mills throughout the State are working to their fullest capacity, and many orders are being given out for oil well tubing, as well as for plates for bridges and ships. The Catarauqua Iron Company, which has a capacity of thirty tons of plate iron per day, are far behind with its orders. Pennock & Sons, of Coatesville, are running two mills night and day, while the Chickier Company is turning out orders so fast that it cannot get enough cars for transportation. The Chester Rolling Mills are making a large quantity of ship plates. Tank iron is also selling in large lots. The market generally is firm, and manufacturers are hoping that the quotations will soon show a favorable advance in prices."

The resumption of work is almost general in the Lehigh region. The Philadelphia and Reading Coal and Iron Company's Rolling Mills, at Reading, are running double time on iron rails. Several iron companies are about to put up additional mills and the fires of a large number of furnaces, which have been cold all summer, are soon to be lighted.

A Sheridan firm is filling orders for pig iron for San Francisco and Montana, while Hay & Co., at Mauch Chunk, have received in two weeks orders for 70,000 pounds of wire. Hon. Wm. L. Scott, of Erie, who has had his rolling mill idle for several months, is about to begin operation for a six-months' run, with a full force of 150 men. The Pottsville spike and bolt works are running day and night on orders from Mexico, Cuba and Canada.

The improved condition of affairs began in the West, and even the Eastern manufacturers are already feeling the good effects. The steel rail mills are employed to their fullest capacity, and the manufacturers report numerous inquiries for large lots, with the prospect of large orders being secured. During the past month a demand for old rails for the West has sprung up, and other calls are anticipated during January and February from the same direction.

The revival in the Schuylkill region is very perceptible. At the vast establishment of the Phoenixville Iron Company (Clark, Reeves & Co., proprietors), at Phoenixville, there is unusual activity, and to better the condition of things for the corporation and its large number of industrious and deserving operatives, a contract has just been concluded for the construction and erection of one solid section of four miles of the Metropolitan Elevated Railway in New York City, besides a number of scattered sections, which will bring the whole contract up to about five miles of railway. This contract will keep the Phoenix works in full operation during the entire winter. About 12,000 tons of iron will be required in the manufacture of the railway sections.

The Glendover Iron Company's works, at Danville, have been running to their greatest capacity for the past four months, and enough orders are on file to keep the establishment running until next March or April. The run is being made upon rails for the Shenandoah Valley Railway and the Pittsburgh, New Castle & Lake Erie Railroad. The company has also on hand a large amount of work for the plantation trade and is doing extra night work on rails.

W. A. E.

ITALIAN METHOD WITH DIPHTHERIA.—The two methods of treating diphtheria—with chlorate of potash and hydrate of chloral—have been combined by Dr. Cesare Clataglia, of Rome, and, as he claims, with remarkable success. He dissolves a drachm of hydrate of chloral in five drachms of glycerine, and applies it to the false membranes three or four times a day, by means of a camel's-hair brush. Of the chlorate of potash he gives from two and a half to four drachms a day, dissolved in four and a half ounces of water, to children of from 3 to 6 years, and an ounce to adults. With these medicines he always combines a tonic and restorative diet.

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A. D. Barker, Yakima City, Yakima county.

AMERICAN GRAIN TRADE.

Very little of the annual production of bread-stuffs of the United States found its way to European markets till 1836-7-8. It was an era of protection, when baby industries were fostered by the agricultural interest in the hope that some time in the indefinite future the manufacturers of looms, plows and shovels would be able to consume the surplus products of the tillers of the soil. This forced industrial prosperity was suddenly checked by successive failures of crops in 1836 and 1837. Blight, mildew, and the fly took the crops of almost the entire Atlantic Slope, and for once in the history of the United States, Europe was resorted to as a granary. There were many firms in New York which had been factors of the corn growers in the State, as well as the intermediaries of those further West. When the drift of commerce became import instead of export these merchants chose to store their granaries for a rise instead of distributing cargoes as they were received. Under their manipulations the price of wheat sprang from a gold dollar—around which it had shifted for 100 years—until it had touched the highest point that it has yet reached up to this year of grace, namely, \$18 a barrel for flour, or nearly \$4 a bushel for wheat. Eli Hart & Co., and E. & J. Herrick were among the heavy grain factors of the city in those days, and their warehouses were fairly groaning under the burden of foreign corn which they had imported from England and were holding for the rise. It is within the memory of members of the Produce Exchange now living that New York artisans and laborers became restive, held indignation meetings denouncing the men who were trading upon popular famine, and at last organized a mob which attacked the warehouses in South, West and Front streets, and helped themselves to the contents. The violence to person extended only to threats of tar and feathers and of summary lynching, which the old leather-head police, inefficient as they were, found themselves able to suppress. The riot bore the good fruit of immediate concession to the hunger-stricken mob, and it was found that all the hungry could be more than supplied by the stores of grain that had been contracted for, and there was no more need for riots (unless of producers) for a full decade. Wheat had a steady ratio to gold during all those years. Any variation was an advance caused by spasmodic differences of European consumption. Strange as it may seem old Exchange men say that those were the days of wilder and more speculative speculation than any that produce men have known since the day of the Atlantic cables. The only mail between New York and England was carried by the Cunard steamers, which reached port only twice a month. Latest advices among produce men were traded on as eagerly as reverses and victories during the war, only that the effects of success or reverse lasted a fortnight at least in the old times. Europe was the market for a surplus that could find no other market, and scarcity or plenty there was the stock in trade.

The year 1847 became notable because of the failure of the Irish potato crop. That season of almost uninterrupted rain opened with corn at 50 cents and wheat at 90 cents a bushel. Flour was a drug at \$4.50. The rise of that year was a legacy of 1846, which had been almost as wet and disastrous to the Irish staple. The speculative rise in the breadstuffs continued onward and upward until on July 2d, 1847, wheat was worth \$2.25; corn, \$1.10 and \$1.15, and flour \$0.50. The docks of New York were crowded with ships and the money center was crowded with men of money from the interior, who had come East to buy or sell the grain upon the margins which then for the first time began to enter into American speculation. The history of New York houses which were prominent in that speculative period is not without instructiveness. Dows, Carey & Co., progenitors of the house which this day is known by the name of the senior of that firm, was saved from bankruptcy by the rise in values and established itself on the prosperous plane which it has since occupied. The bankers of the period finding deposits heavy, sought the produce bourse for profitable investment, and shipping merchants took shares as well. Prime, Ward & King, then the most considerable bankers of the money center, dipped into wheat and lost. Hicks & Co., also lost a fortune made in shipping in trying to sustain a falling market in bread-stuffs.

The trade held the even tenor of its ways hereafter until the fall of 1849 and the early month of 1850. Suydam, Sage & Co., who

had been sufferers by the riots of 1837, but had recovered their fortunes in the other prosperous years, felt themselves strong enough to try a corner in flour. They bought right and left, until their holdings aggregated 400,000 barrels. They had advanced the price a few points, but good European crops more than destroyed any counterbalancing advantage, and their venture was disastrous.

Thereafter speculation was conditional upon scarcity in the foreign markets which handled America's surplus. In 1852 the crop of France turned out poor, and under the impulse of orders from English factors prices advanced from 95 cents for wheat in the early spring to \$1.35 in the following autumn. That, however, was a steady rise produced by natural causes, and was used as a help to fortune by the greater part of New York merchants. There was no startling decline in prices until the latter part of 1854, when European crops regained their normal standing. The custom of dealing in futures had become a recognized method of speculation, but business men were conservative in speculating and managed to shift the burden upon their French correspondents, so that any losses were borne by them, even though flour had declined from \$0.50 a barrel, the highest point that it touched between '37 and '54. The year 1857 was marked by a decreasing value of cereals that was unprecedented up to that time. For various reasons bankers' and money changers lost credit and suspended, and the produce men were unable to place exchange and so shipments of grain and flour were almost at a standstill. Even '73 did not produce as universal bankruptcy, inasmuch as there was not a house dealing from the Produce Exchange, then five years old, that was not found to ask for concessions from creditors.

The first year of the war brought the same difficulty as to the placing of exchange. When some medium of exchange had been established the prices of grain preserved their ratio to gold until some rash capitalists endeavored to force a corner in cereals by force of money and left their project bankrupt. The speculative features of the trade have confined themselves mainly to the depository centers of the West since the cables have brought these depots as near the European markets as New York is. Even at the best that capital can do, produce men feel easy in the belief that no "corner" in Milwaukee, Chicago or Buffalo can advance prices in New York beyond a few cents.—*N. Y. World*.

THE TRANSMUTATION OF METALS.

A correspondent of the London *Daily News* writes: "Large as have been the drafts of late upon our scientific credulity, there has hardly been one which makes so heavy a demand upon our powers of faith as is involved by the statement that Mr. Norman Lockyer has realized the alchemist's dream, the transmutation of metals. Strange, incredible as this may appear, there is sufficient evidence of its results having been effected to make us at least suspend our judgment and await the results of further experiment before absolutely refusing to believe. What seems certain is as follows: On Monday last in the presence of a small party of scientific men, Mr. Lockyer, by the aid of a powerful voltaic current, volatilized copper within a glass tube, dissolved the deposits formed within the tube in hydrochloric acid, and then demonstrated by means of the spectroscope, that the solution contained no longer copper, but another metal, calcium, the base of ordinary lime. The experiment was repeated with other metals and with corresponding results. Nickel was thus changed into cobalt, and calcium into strontium. All these bodies, as is well known, have ever been regarded as elementary, that is, as incapable of being resolved into any components, or of being changed one into another. It is on this basis that all modern chemistry is founded, and should Mr. Lockyer's discovery bear the test of further trial, our entire system of chemistry will require revision. The future possibilities of the discovery it is difficult to limit.

"The great object of the old alchemists was, of course, to transmute base metals into gold, and so far as our knowledge goes there is no more reason why copper should not be changed into gold as well as into calcium. The means at present employed are obviously such as to render the process far more costly than any possible result can be worth; but this is necessary the case with most scientific discoveries before they are turned into commercial facts. I am not, of course, holding out any probability that such will ever be the case; but an attitude of mere incredulity is by no means justifiable in the matter."

"Mr. Lockyer is one of our best living spec-

troscopists, and no man with a reputation such as his would risk the publication of so startling a fact as he has just announced to the scientific world, without the very surest grounds. He is known by his friends as somewhat sanguine, and he does not pretend to be an accomplished chemist, but he was supported on Monday by some of our leading chemists, all of whom admitted that the results of his experiments were inexplicable on any other grounds but those admitting of the change of one element into another, unless, indeed, our whole system of spectral analysis is to be upset, the other horn of a very awkward dilemma. He has already made a communication to the Paris Academy of Sciences on the subject, and he is about to read a paper before our own Royal Society, in which we may hope to learn the results of his latest experiments, made since the paper was read at Paris. For this full account of his researches we shall look with no small interest, for, since a hundred years ago, Priestley discovered oxygen and founded modern chemistry, there has been, there could be, no discovery made which would have such an effect on modern science as that the so-called elements were no longer to be considered elementary."

CLEANLINESS OF STABLES.

An Essential to Healthy Horses—A Fact Not Appreciated.

We frequently come across remonstrances against keeping harness in stables, the reason given being that the ammonia prevalent there rots the leather and soon destroys the harness. Now this is beginning at the wrong end to remedy an evil. We may talk and advise "year in and year out" about this matter, but harness will be kept in the stable in spite of all. Where else can the majority of people who keep horses hang these trappings? A rich man may have a closet in which the harness may hang safely from fear of ammonia and other dangers; but the average horse owner will have his peg behind the beam, because he can have no other way of disposing of the harness. But the trouble would end if the production of ammonia was prevented. Enter an ordinary stable at any period, but especially in the winter, when every cranny through which the wind can come in is carefully stopped, and what an offensive odor offends the nostrils and irritates the eyes! Is this odor of ammonia, strongly alkaline and irritant, injurious only to the harness? What of the horses, and the tender membranes of the eye, the throat and the nasal passages? Do you think they are less sensitive than oak-tanned harness leather, well greased and preserved as it is? By no means. If the prevalent odors injuriously affect the leather, you may be sure the eyes suffer; the throat and lungs are irritated, and the nasal passages become inflamed. Then occurs the frequent moon blindness; ophthalmia, weeping of the eyes, followed by inflammation, white specks, clouded cornea, and finally loss of sight; then followed coughs, bronchitis, pneumonia, hives, catarrh, nasal gleet; and by and by, when the blood has become poisoned by the absorption of diseased matter from inflamed and suppurated membranes, farcy and glands—dreadful and fatal to man and beast, to result. And while we think of saving the harness and removing it to a purer place, the beast which is worth a dozen set of it, is left to rot from these pungent gases without any help. Clean the stables, and the harness may hang in them safely; and be sure, if the stable is not a fit place for the harness, it is no place for the horse. A barrel of plaster can be procured for about one dollar. It is worth that as a fertilizer. It is worth ten dollars as absorbent of ammonia, and a hundred as health-preserver for the horses, not counting the saving to the harness. Sprinkle it everywhere and be liberal with it.—*Rural New Yorker*.

MILLERS IN THE WEST ARE EXCITED.

The millers in the great milling States of the West are making opposition to farmers, binding grain with wire. They claim that short and small pieces of the wire get into the stones and bolting cloths, seriously injuring both. The Minnesota millers have passed a resolution that the price of wheat be degraded 10 cents per bushel under corresponding grade in purchase of any wheat containing wire. The Wisconsin Millers' Association, held recently at Milwaukee, did not take any active measures against wire binding, though the subject was discussed. At a late session of the Illinois Millers' Association a resolution was presented by the Secretary to the effect that the use of wire bindings is injurious to mill machinery, and, therefore, millers, as a

class, recommend a discontinuance of the wire binders in favor of cords or other binders that work no injury to the machinery.

The *Prairie Farmer*, while earnestly advising every wheat-grower not to allow the wire to pass through the thresher (a careful supervision of the work will prevent this), says that the damage to the grain for millers' use could never under ordinary circumstances amount to anything like the price stated by the Minnesota millers, and a fair inference is that they have prescribed this acute remedy with a view to driving wire-binding machinery out of use. This they will never do until the twine and other binders are made to work successfully, though it may result badly for the millers of the State by causing the best grades of wheat to be carried out of the State for milling. When labor is scarce during harvest, the farmers will bind with wire until some other economical means are provided them. If the great wheat fields of the West should be compelled to go back to the old system of binding by hand, the crop would rot in the fields. The journal quoted from recommends millers generally, rather than make the onerous discrimination of the Minnesota millers in regard to wire-bound wheat, to use their inventive faculties in discovering some means to free the wheat from the wire, if it will be cheaper than wearing the stones and the bolting cloths. The *Iowa State Register*, commenting on this opposition, says the binding wire is smooth, soft iron, easily mashed, and cannot possibly do the damage claimed; but that, being unrestrained in their toll, now when the farmer sees a plan of escape from the exorbitant charge of harvest hands, the millers are moving to take the last item of profit in the production of grain.—*N. Y. World*.

ROACH OR RAISIN?

The great Napoleon once sat down to his breakfast, and, breaking in two a roll, saw in it a roach. Closing it again he laid it down, and sent for the Marshal of the Palace to inquire from whom the bread for the imperial household was procured. He learned that a "Baker of the Palace" was kept, who drew a large salary for himself and a proper number of journeymen bakers; that he did not work himself, but merely looked over his subordinates.

The Emperor ordered him to be called, and soon the baker, very greatly astonished, and also very uneasy at the honor, made his appearance.

"Are you the Baker of the Palace?" said the monarch, with a look that bode no good.

"I am, sir," was the answer.

"What is this, then?" continued Napoleon, holding up to him the roll, and pointing at the roach.

But the baker was a man of wit and presence of mind; taking the bread from the hand of the Emperor, as if he was short-sighted and wanted to look at it closely, he quickly bit off the part that contained his guilt, the roach, and swallowed it, saying: "It is a raisin, your majesty."

The Emperor could not help admiring the answer, and contented himself with telling him "very well, but never put any raisins into my bread again."

TWENTY-FIVE YEARS' WARS.—The following figures have been carefully compiled by a contemporary from the official statistics of the various nations concerned, and include, in addition to the troops slain, a portion of the deaths occasioned by the ravages of the wars among the civil population: (I.) Lives lost, 1852-77—Killed in battle or died of wounds and disease—Crimean war, 750,000; Italian war (1859), 45,000; war of Schleswig-Holstein, 3,000; American civil war—including both North and South—800,000; war between Prussia, Austria and Italy, in 1866, 45,000; expeditions to Mexico, Cochinchina, Morocco, Paraguay, etc., 65,000; Franco-German war of 1870-71; France, 155,000; Germany, 60,000—215,000; Turkish massacres of Christians in Bulgaria, Armenia, etc. (1876-77), 25,000. Total, 1,948,000. (II.) Cost, 1852-77—Crimean war, £340,000,000; Italian war of 1859, £60,000,000; American civil war; the North, £940,000,000; South, £460,000,000—£1,400,000,000; Schleswig-Holstein war, £7,000,000; Austrian and Prussian war, 1866, £66,000,000; expeditions to Mexico, Morocco, Paraguay, etc. (say only), £40,000,000; Franco-Prussian war, £500,000,000. Total, £3,813,000,000.

A man was boasting that he had an elevator in his house. "So he has," chimed in his wife, "and keeps it in the cupboard in a bottle."

WINDMILLS.

Windmills do not seem to have been known to the Greeks and Romans. The earliest traces of them are found in Holland, and the fact that they are still in use there (many of the mills being of large size) combined with the known habits of thrift of the Dutch, prove that there are strong reasons for their universal use there that may be derived from the flat conformation of the country. They have been found profitable and safe investments, and so they could in the United States as well, but of course on a still larger scale. In the construction of the windmills of Holland the usual form is a square or round tower of wood, stone or brick. Many of such can be seen on Long Island, where the Dutch originally settled in this country. There is one in a good state of preservation in Flatbush, King's county. The main shaft, at or near the top, is inclined at an angle of about ten degrees, and carries four arms with widening vanes or sails. The arms are formed concave toward the wind, and the sails or slats should be set at an angle to arms of seventy-two degrees at the extremity nearest to the shaft, and eighty-three degrees at the outer circumference. These proportions have by many experiments been found to be most effective. Since the velocity of the different parts of the sail is in proportion to their distance from the axis, it follows that in order to produce the greatest effect, every elementary portion of it ought to have a different angle of weather, diminishing from the center to the extremity of the sail. Smeaton found by a series of experiments that when the sails were weathered concave to the wind, and the angle of inclination was greater toward the circumference, the effect was much better than when weathered in the common way. But the effect was greatest when the sails were largest at the outer rim, so that the length of the latter was equal to one-third of the length of the arm from axis to circumference.

It appeared from Smeaton's experiments that the most efficacious angles at the different parts of the sails were as follows:

Arm of axis to circumference divided into six equal parts.	1.	2.	3.	4.	5.	6.
Angle with the axis.....	75°	71°	69°	70°	71½°	83°
Angle of weather.....	18°	19°	18°	16°	12½°	7°

From this it will be seen that the surfaces of the sails should be helical, or nearly so, while in action.

As the sails are twisted somewhat by the action of the wind the surface is more helical when in motion than when at rest. In the best forms of mills the thin venetian slats, of which the sails are composed, are made so as to open partly by the increased centrifugal force when the mill runs at too high a speed. The velocity when unloaded is considerably quicker than the wind. Those mills have caps bearing the main shaft, large cogwheels and sails, and the cap or dome revolves horizontally by means of friction rollers on an iron bed. The cogwheel working into a pinion on an upright shaft below gives motion to all the machinery. In some cases where slow motion only is wanted, the pinion is on the main shaft, and works into a large cogwheel. In the more modern mills the cap is made to revolve, and the sails to face the wind by a wheel opposite the sails, and not unlike a screw-propeller with straight vanes, but little inclined to the axis of rotation, so that when the wind is directly in front the wheel is motionless, but revolves to one side or the other as the wind changes, and by a small pinion working into a larger cogwheel turns the cap so that the sail always faces the wind.

Horizontal windmills are almost unknown in the United States, although several patents for them have been obtained, and they are in little use to any country save Spain and Persia. Their effective force is less than the vertical mill, being about one-eighth. It is probable, however, that this form of mill could be improved if attention were bestowed on it, and the same principles applied in directing the wind on the vanes and the exit therefrom as has been the mode of applying water to the turbine.

The windmills of Holland are of great importance to the existence of the dykes and the sanitary condition of the land. From the high cost of fuel there it is doubtful whether without them there would not be a most unfavorable revolution in all the business of the country, as they are used for a multiplicity of purposes.

The general appearance of the large grain mills of Holland is as follows: The basement is of stone or brick, supporting a tall superstructure of wood, capped with the revolving hood which carries the main shaft and sails. The outside is handsomely thatched with straw. In the first story the granary and

meal rooms, into which the seven or eight kinds of flour and feed come from above through spouts. The second floor is for bolting and separating. The third is the grinding room, where there are usually about three pairs of five-foot stones. In a strong wind all these can be run, but almost the lightest breeze is sufficient for one pair. The Dutch mode of using a regulator to set the stones close together is not to be commended. There is a hoisting apparatus by which all the grain to be ground is elevated through the trap doors to the fourth story, from whence it descends to the stones. This room contains the cleaning machinery, and just above is the ponderous main shaft, which, with a slow grunting movement through cogwheel, pinions and bevel-wheels, turns all the heavy machinery throughout the mill. Some attention to this subject has impressed on us the belief that an important productive force might be developed here by advancing the windmill from being little more than an agricultural implement until it shall approximate to a machine of first-class power.

THE POPPY AS FOOD.

BY ALEX. FORSYTH.

"My bane and antidote are all before me." This subject cannot be too often insisted on, for no one will believe that anything good could possibly come out of a poisonous poppy head. The milk is a deadly poison if taken in large doses, but the seed is a valuable article of wholesome food, and besides being used as bread, a clear oil may be expressed from it, fit for domestic use, much after the fashion that we use butter. In reading up some very old books, I lately came across this article, and the author gave extracts from those before his time, to the effect that people mixed poppy seed with their bread; and as this view of the subject was so very simple and practicable, I thought I could do my friends some service by getting them first to grow poppy seeds, and then get them mixed with bread, as this half measure would take away all ideas of cooking the article for home use. A friend, who had lived some time in Hindostan, told me of the immense quantities of poppy seed that changed hands in some of the markets there. The juice of the husk, or, so to speak, the poppy head, is the deadly opium of commerce, but the naked seed is wholesome food, and the oil when expressed fetches a high price; surely, then, a plant of such easy culture and so marvelously prolific need not be neglected any longer. How often has the tale of the grain of wheat cast into the earth been told by agriculturists in every age, and yet we see it cropping up now and then in the form of some theory to mend its condition, either to increase the quantity or improve the quality, such as by some early variety to catch our best days of summer, or some new manure suited to one locality, yet indifferent to another; yet it is but the grain of wheat after all, the old, old story—but nothing is trivial that brings sustenance to either man or beast. Some plants have inherited a bad name and richly deserve it, whilst others, meritorious, suffer and keep still until their virtues find them out. The poppy is a notable example of having both these characters—one good, the other bad. It is quite beyond the state of the question here to say anything either for or against the poppy, for it has been a bugbear to nations for the last 100 years, on account of the deadly drug opium obtained from its husk; but here the tune is changed, and the poppy seed comes to the front, quite able to justify its introduction into agriculture.

Over and over again have I advocated the culture of this rampant annual. It suits our climate, as it has plenty of time to flower and ripen seed in our Northern summers, and grows freely in all soils and situations. Its seed is cheap, and it is never adulterated, always true to name. It is a plant of rapid growth, strong in the stem and branches, needs no stakes or props. The ripe seed has a fine nutty flavor, and is eatable from the husk or head, and it needs no miller to grind it before using. But this plan of the ancient growers, to mix it in the dough with the batch of bread, is an easy way to get it introduced into the household economy. The prolific character of this plant, the *Papaver somniferum* of the botanist, is something almost incredible. A good full-sized head, such as we see in druggists' windows, will contain not some sixty and some hundredfold, but several thousands. I have counted them to see what an acre of ground would take at nine plants to every square yard, and find that one plant would carry 50,000 perfect seeds, and if this yield is to go for nothing scientific farming is a failure. Moreover, the seeds are protected

from the weather in harvest time, and this in our hilly ground and northern countries is a thing of considerable moment.

"FORGET THEE?" wrote a young man to his girl, "forget thee? When the earth forgets to revolve; when the stars forget to shine; when the rain forgets to fall; when the flowers forget to bloom; then, and not till then, will I forget thee." Three months later he was courting another girl, with a squint and ten thousand pounds.—*Figaro*.

ALUM IN FLOUR.—A French scientist, M. Buchner, has discovered that a single drop of alcoholic extract of Campeachy wood, placed upon pure flour or bread, will cause a brownish-yellow stain. If the flour contains alum, in the proportion of 1 per cent or 2 per cent, the color will turn to a greyish-blue or violet grey. With 1½ per cent of alum, the tint is reddish-yellow with a border of grey-blue, and small blue spots can be discovered by examining it with a lens; ¼ per cent of alum is the limit of reaction, when the blue border disappears, although the small spots are faintly discernible.

EXPERIMENTS IN WHEAT CULTIVATION.—Experiments have been made in Michigan in cultivating wheat, and the results are not only satisfactory but astonishing. A committee was appointed to oversee the experiments and make the report. Sixty-eight pounds of seed per acre were sown in drills 16 inches apart, and 90 pounds per acre were drilled in the usual way. That in 16-inch drills was cultivated with a horse wheat hoe once in the fall and twice in the spring; the other of course was not cultivated after sowing. The report says that the 16-inch lot did not lodge or crinkle, while the 8-inch lot did so badly. The average yield was 60½ per cent greater in the 16-inch drills than in the 8 inch drills. The *Agriculturist* remarks: "It is as reasonable to believe that grain crops should be benefited by cultivation as 'hat potatoes, corn, cabbages and other crops should be. Hoeing wheat in Europe is not an uncommon practice, and farmers in this country have begun it with marked success."

IMPORTANCE OF THE CORN CROP.—The importance of the country's corn crop is hardly understood by the general run of readers, since they do not know what a wide basis of prosperity it constitutes. It is the basis or an annual pork crop, comprising at least 10,000,000 head of hogs; its consumption as human food is very large and increasing in both hemispheres; it is more universally fed to stock of all kinds than any other cereal, and is, in a word, one of the most valuable of agricultural products. The acreage of last year in corn reaches 50,369,000, and the yield probably not less than 1,500,000,000 bushels. The exportation of corn has increased from a little over 7,000,000 bushels per annum ten years ago to nearly 90,000,000 at the present time. At this rate of increase corn promises to become the king of commerce. In this connection it is interesting to know that the production of grain of all kinds in the United States is forty bushels per capita against only sixteen bushels for all Europe.

BRAN AS A FERTILIZER.—Mr. Kern, of Lehigh county, Pa., tried bran as a fertilizer for potatoes last year, and reported that it increased the yield one-third. Another experiment on corn is recorded, where it produced marked results, the rows on which the bran was used soon being six inches taller than the other rows.

As seed will not germinate in dry bran, it would be well to compost it before using it. Mix it with two or three times its bulk of rich mould from the woods, sprinkle enough manure water on it to make it heat, and then shovel it over until thoroughly mixed. If this is done two or three weeks before using, it will partially decompose it so that in contact with the seed it would not injure it. We read that tobacco growers of the Connecticut Valley use bran in large quantities, importing it from Iowa and Minnesota for this purpose. There is a rich field for experiment in home-made fertilizers, which farmers should work up. There is a fascination in the work of conducting these experiments which pays for the trouble itself, besides the useful knowledge obtained.

December 30th, 1878, the contract was let for extending the Atchison, Cawker City & Denver Railway from Beloit to Cawker City. The end of the division will be at Cawker City, and round-house and machine shops and elevators will be erected. Cawker City is now the liveliest town in the West, and buildings are going up like magic.

ENGLISH ARTIFICIAL CATTLE FOOD.

Dr. Voelcker, in an interesting paper on the *Influence of Chemical Discoveries on the Progress of English Agriculture*, makes the following remarks upon the articles of food used for feeding and fattening purposes:

"Linseed and rape-cake, especially the former, are largely used for feeding and fattening purposes, and, if pure and in good condition, no food is considered to equal linseed cake for rapidly fattening sheep and oxen.

"Earthnut-cake is occasionally sold in England to the farmer, but more frequently it is bought up by cake-makers, and used for adulterating linseed-cake.

"There are two varieties of cotton-cake. One is made in England from Egyptian cotton-seed, shell and kernel crushed together, and the other is principally imported from New Orleans, and made in America, from the decorticated seed. Decorticated cotton-cake has also been manufactured in Liverpool to a small extent the last year or two from the kernels of cotton-seed imported from America. Both descriptions of cotton-cake are largely used by English stock-feeders. Whole seed cotton-cake has been found very useful to store sheep and oxen out on grass, at periods of the year when they are apt to become affected by scour; and it is also given with much advantage to stock fed upon abundance of succulent food, which has a tendency to keep the bowels in too loose a state. In these cases the astringent principle contained in the husk of cotton-seed acts medicinally as a never-failing corrective. Decorticated cotton-cake, being made from the kernel in which all the nutriment resides, is a much more concentrated food than cake made from the whole seed. On an average it yields about 40 per cent of nitrogenous matters, and possesses high manuring qualities, but it is too rich in nitrogenous compounds to suit by itself the health of herbivorous animals. It is rather indigestible, and requires to be broken up finer than linseed-cake ordinarily is; it should be given to fattening stock more sparingly, and mixed with about twice its weight of Indian corn or barley meal, or meal rich in starch and comparatively poor in nitrogenous compounds.

"Experience further has shown that, when sheep are put on rough poor pasture, on which they are obliged to ramble over much ground in order to pick up sufficient food, the very best means of making the most of the wiry herbage, and to keep the sheep in good condition, and at the same time to materially improve the grass land, is to allow them from one-half to three-quarters of a pound of decorticated cotton-cake per head per day. In that case it is essential, for maintaining them in good health, to give the sheep free access to water.

"Cocoanut-cake and palmnut-kernel cake and meal are produced at Liverpool and other places in England, and are much appreciated for their fattening properties. These cakes contain from 14 to 16 per cent of albuminous compounds, and variable proportions of oil, and are better adapted for fattening stock than for young growing animals or store stock.

"Locust beans in the shape of meal, containing on an average from 50 to 54 per cent of sugar, are much relished by horses, oxen, and sheep, and are used in England to a considerable extent, and with advantage, as an addition to other and less palatable food. Locust bean meal is also a favorite addition to almost all compound cattle foods, compound feeding-cakes, and cattle-spices sold in England.

"Rice-meal, obtained in preparing rice for consumption, is rich in starch, the better qualities generally containing from 7 to 8 per cent of oil, and about the same proportion of albuminous substances. It is largely employed in England for fattening pigs.

"Another good fattening grain which is seldom seen on the Continent, dari or durra grain, the seed of the *Andropogon Sorghum*, is occasionally imported into England, and sold at a cheap rate.

"Indian corn, foreign beans, oats, and barley complete the list of the concentrated foods most frequently employed in England for feeding or fattening purposes."

Maine's once prominent industry, shipbuilding, gives employment to a constantly decreasing number of persons, not half the work that was done in the season just closing that was done in the previous year. Indeed, only eleven ships were built in the State, and of the ninety-six vessels constructed, the average tonnage was only 425, or, taking out the ships, less than 300. The prospect is that less ship building will be done in 1879 than in any single year in the last thirty.

GRAIN.

Peculiarities in its Normal and Manufactured State.

An Investigation Under the Microscope—Showing the Adulterations and Natural Evils to which It has been Subjected.

A COMPLETE INVESTIGATION OF THE SUBJECT BY ONE OF THE LEADING CHEMISTS OF EUROPE.

Flour in General—Wheat Flour—Rye Flour—Barley Meal—Oat Meal—Indian Corn—Rice Meal.

[Translated from the German of Dr. Herman Klonk, expressly for the UNITED STATES MILLER,—cuts reproduced by our special engraver from the original.]

GENERAL REMARKS.

Those plants which belong to the botanical family of cereals we call grain, or, speaking more generally, they belong to the grasses and furnish flour in their seed. Of these, Germany produces especially wheat, rye, barley, oats, maize or Indian corn, and consumes rice in the granular form and as meal. As is well known, the meal of these plants is obtained from the seeds which are ground. According to the finer or coarser grinding, the number of times it passes through the mill, the bolting, and other well-known methods, white and gray, fine and coarse kinds of flour are distinguished; but by these terms the real quality and nutritiousness is not exactly expressed. They are only the characteristics which are of importance for the mode of application and the technical purposes of the kitchen and the bakery, for we shall soon find that the coarser and gray flour, when it is unadulterated, is by far more nutritious than the finer and whiter flour. Grain consists of two kinds of ingredients, which in a double way give it importance for nutritious purposes, and at the same time its value in commerce, namely, of such substances which contain no nitrogen, and such as do contain it. This distinction is not only of chemical interest, but is also of great importance for the value of grain as a nutrient, since it has been ascertained by physiological experiments that the process of organic life of animals as well as of men necessarily and indispensably requires both kinds of substances to sustain it, those which contain nitrogen as well as those which do not, or the albuminates and carbonic hydrates in suitable proportion (1: 4 to 5), and that those ingredients of all food which do not contain nitrogen merely pass through the organism as fuel, sustaining breathing, producing heat, and in the form of carbonic acid and water, that is as substances consumed by the oxygen, are removed from the organism, while all those ingredients of the food which do contain nitrogen serve for the formation of blood and enter the structure of the organism. Those ingredients which contain the nitrogen are always the most valuable and are present in a suitable quantity, for which reason it is correct to estimate the value of a nutriment according to the amount of nitrogen it contains, that is to say of that substance which will produce blood. We find in grain according to the different kinds of it, different proportions of such ingredients as do not contain nitrogen and such as do; the former present themselves as starch meal, cellular substance, the latter as gluten and albumen. These substances are located in a kernel of grain in such a way that those which contain the nitrogen form the more external layers. For instance, let us look at a perfectly ripe grain of wheat or rye, and we shall find that it consists in the first place of a husk, which is generally formed by three rows of oblong, closely-layered cells. Below this there is a second so-called inner seed-shell, usually formed by a row of oblong thick-walled cells, the inner cavity of which is only very small. Then follows a layer of large, dark, strong cells, which contain the gluten; and now at length follow the large, six-sided cells which form the bulk of the seed, and enclose particles of starch besides albumen. By grinding, the harder husk and gluten cells are separated from the softer starch-cells. They resist the finer disintegration by the millstones and form the bran. The more the flour is freed from its bran, the less of gluten will it contain—that is, of such substances as will produce blood; for while the cells of the husk contain from about 3 to 4 per cent of gluten, the third (gluten-cells proper) layer contains from about 14 to 20 per cent of it. Moreover, there is a proportion of gluten distributed in the starch-cells also, but in comparison to the glutinous contents of the separated bran, in only a very small quantity. By a very simple method the two principal components of grain,

the starch and the gluten, may be separated. To a certain quantity of flour so much water is added that the former is thoroughly moistened, and a dough can be made of it; this dough is kneaded with both hands until it presents a uniform, elastic and soft mass; it is then placed over some vessel that is covered with a hair-sieve, or has a muslin cloth spread over it, and is kneaded so long on this filter, while a fine jet of water is poured over it, which, as it were, washes out the dough, that the water which is filtering through ceases to have a milky color. On the sieve or cloth there will only remain a sticky, gluish, whitish mass which had before rendered the dough tough. It is the gluten. The milky water that has been filtering through is allowed to stand for some time; it becomes clear and forms a white pulverized sediment which consists of starch. Good flour must furnish from about 8 to 10 per cent of dry gluten and 65 to 70 per cent of starch by this process.

The quality of flour is injured not only by the admixture of sand, gypsum and cawk which are fraudulently mixed with it, but also by vegetable and animal substances, which have either accidentally found their way in it or which are the result of the decay of the grain or flour. It is of great importance to discern whether the flour is injured by the admixture of germs of fungi, so-called sporules, or of other components of diseased forms of the ear of grain, since diseased grain is very often ground and sold, and then produces poisonous bread. The microscope most readily discloses such admixtures, when suspicion has once been aroused by the outer appearance of the flour, or when diseases of the grain are especially frequent and general. Among the vegetable admixtures ergot, smut and dust are of special importance.

A fungus called Uredo caries or sitophilus (Canker) is developed in the seed-bud of the different kinds of wheat; it may already be discerned, before the ears emerge from the sheath by its bluish color and it renders the later lighter grains speckled. It grows exuberantly in the substance of the corn with rather large sporules, which are black, globular, and have a greasy touch, disagreeable odor, soil the mill-stones, and not only give the flour which is mixed with them an unnatural color, but they also have an injurious effect upon the health of the consumers. Although a good, honest farmer should separate such diseased corn from the healthy by sifting, winnowing and washing (whereby the diseased grain

will float on the surface of the water) yet there are a number of dealers who allow it to remain and be ground into flour. By the use of the microscope one is enabled to discern and point out the sporules of these fungi immediately among the particles of starch. Fig. 1 represents these sporules magnified 430 times. Smut (Uredo segetum) is a parasitic fungus whose sporules are smaller, globular, and look like soot. On the leaves of the different kinds of grain it forms a blackish dust which rubs off and falls off easily and will therefore rarely be mixed with the flour, but it adheres to the straw and is injurious to cattle. Fig. 2

shows it magnified 420 times. Ergot, Sclerotium clavus, or also called Secale cornutum, is a crooked, sporule-like excrescence, which is furrowed lengthwise, from 14-18 min. long, which is externally of a purple-black hue, internally is white, reddish and pulpos, and makes its appearance in wet seasons, especially in rye, wheat and cockle. This excrescence is a morbid degeneration of the seed-bud, a

parasitic development of the fungus, which suppresses the full growth of the healthy seed. Ergot is found very often in flour, and when present in considerable quantity it gives rise, when partaken of, to a dangerous disease, which in some years and countries becomes epidemic. It is called raphania, Morbus cerealis, affects the nervous system in particular, and its principal symptoms are convulsions, painful itching and paralysis. A very careful separation of the ergot from the grain is of great importance, but still there are some unconscientious farmers who allow considerable quantities of it to remain in the grain. The microscope will also disclose the presence of an admixture of this kind in flour that seems suspicious, for it will discover the peculiar

cells of sporules, which are characteristic of ergot among the starchy particles. Fig. 3 represents the surface of a cross-incision of ergot magnified 420 times. In a the rows of colored cells with the sporules which are developed in them may be seen, in b the reddish-colored parts, in c the cells which contain oil. These three parts are much more magnified (670 times) in order to give a clearer idea of their character.

ter, and of how the ergot when ground is distributed in the flour. According to Jacoby ergot can be perceived in flour when 10 g. of the suspiciously-looking flour are treated with 30 g. of boiling alcohol, is then allowed to settle, the liquid poured off, and the residuum treated again in exactly the same manner; then the residue out of which by the above-named process all the greasy substances have been taken, is poured out, put into a test-tube with 10 g. of alcohol of 90 deg. and shaken therein; then when the flour below the colorless alcohol is settled, from 10-20 drops of sulphuric acid are added, the mixture is well shaken and then again allowed to settle. A liquid is then obtained which will be more or less red according to the amount of ergot contained in the flour. But if the liquid remains colorless, the flour is pure and free from ergot. According to Elsner und Wettstein, 1 per cent. of ergot in flour is sufficient to turn it red when it is sprinkled with water.

[To be continued.]

FLOUR MILLING IN PENNSYLVANIA.

[Special Correspondence United States Miller.] HARRISBURG, Pa., January 20, 1879.—The flour milling interest of Pennsylvania still continues to improve in its different departments, but there has been no particular augmentation of the flour product since my last letter. According to the statistics, as gathered from official and trustworthy sources, by the UNITED STATES MILLER correspondent, it is found that the wheat crop of this State is on an average

19,000,000 bushels annually. This vast wheat product mostly finds its way into the manufacture of the "staff of life," and helps to constitute the second largest industry in the Keystone State. In Pennsylvania there are 2,985 flour mills, which are supplied with 8,019 run of stone. The valuation of the annual product of these establishments is over \$50,000,000, while employment is furnished in and about them to between 12,000 and 15,000 industrious and deserving operatives.

The members of the Pennsylvania State Millers' Association while mingling together at the Stevens House, Lancaster, on their meeting-day, Tuesday, January 14th, had many private discussions outside of the regular business of the conference. It seemed to be the impression of all that a new era is dawning upon the milling industry of Pennsylvania, and the really enterprising millers of the State are preparing to take advantage of the anticipated good times that are approaching. There has for many years existed a proverbial and strong spirit of old-fogyism in the flour milling districts, and many of the otherwise worthy "dusty millers" have allowed themselves to be contaminated with its influence. There are some things that, after once becoming settled upon any class of people, are extremely difficult to eradicate, and one of these peculiar things is old-fogyism. This incubus has been allowed to twine itself around the important flour milling industry of Pennsylvania, which is centered in what is known as the "Pennsylvania Dutch" region of the commonwealth, where a strangely peculiar, superstitious and shrewd and sharp-bargaining burghers are large mill owners.

Unfortunately for the flour manufacturing interest the "Pennsylvania Dutch" millers, while occupying, and almost entirely monopolizing, the very heart of the flour-producing country,—Lancaster, Montgomery, Berks, Lehigh, Bucks, Northampton, Dauphin, York, Franklin, Northumberland, Lebanon, Columbia and Montour counties,—have always been highly instrumental in retarding the growth, improvement and prosperity of what, had it not been for this checking influence, would have been the foremost industrial interest in this State. Undoubtedly the "Pennsylvania Dutch" element, while very thoroughly practical, competent, and honest in the manufacture of flour, has been an impediment to the enterprising, actively-moving and more go-ahead millers. The members of the Pennsylvania State Millers' Association having, at last, apparently discovered what may result in possible defeat to some of their plans, are endeavoring to inculcate new and more intelligent and promising ideas among the slow-moving, suspicious and too economical "Pennsylvania Dutch" millers. To change the opinions of the old-style, stolid and peculiar-thinking grinders of wheat, rye, corn and oats, will be a hard matter, indeed. If the millers accomplish the conversion of their sturdy, uncultured "Pennsylvania Dutch" brethren to their ways of thinking, it will take them a life-time to get them to adopt the new processes for manufacturing flour. However, the gentlemen who have undertaken the work of civilizing the "Pennsylvania Dutch" millers, have the heartiest wishes of the UNITED STATES MILLER correspondent for their success. There is no doubt that a much more powerful State Millers' Association could be established in Pennsylvania than the present one,—which is, however, very excellent and influential,—could the majority of the millers in the districts previously enumerated be persuaded to become members of the organization.

The good work of the exportation of American manufactured flour and mill machinery for the manufacture of the "staff of life" is still pursued with an activity, and corresponding profit, that must, eventually, result in the accumulation of fortunes to the parties who are engaged in the shipment of the flour and machinery. It is understood that prominent iron-ware-goods manufacturing house of Philadelphia will, in the spring, construct for erection, at Para, South America, an entire iron building to be devoted to the business of flour manufacturing. The building will be shipped in pieces, and workmen will go to the place of its destination and put it up. This novel flour mill will be fully supplied with improved machinery, and will have 150 run of stone. A practical miller will be sent from Philadelphia, by the company who are interested in the enterprise, to take charge of the establishment after it is in working operation. A New York flour mill machinery firm are also contemplating the construction of an extensive flour mill on the line of the new Madeira and Manoel railroad, in South America, and it is expected that the contract for the material and work will be completed within a month or so. From all this, it can certainly be concluded that America is destined to lead in this particular enterprise, which must bring prominence and affluence to the projectors. T.

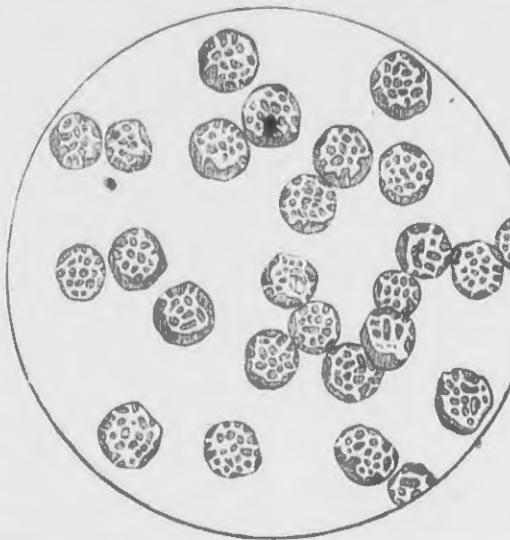


FIG. 1. SPORULES OF CANKER (UREDO CARIES) FOUND IN UNHEALTHY FLOUR, MAGNIFIED 420 TIMES.

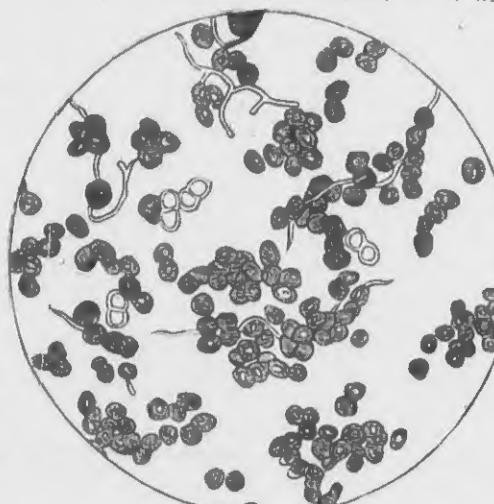


FIG. 2. SMUT SPORULES (UREDO SEGETUM) MAGNIFIED 420 TIMES.

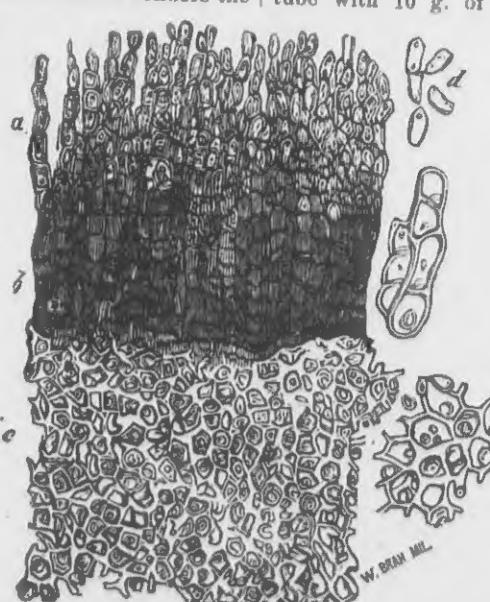


FIG. 3. SURFACE OF A CROSS INCISION OF ERGOT (SCLEROTIUM CLAVUS), MAGNIFIED 420 TIMES.

EVERYBODY READS THIS.

NEWS OF THE WORLD.

Items Gathered from Correspondents,
Telegrams and Exchanges.

Alabama.

One miller has been elected to the Legislature in Alabama.

California.

The oil well at Los Angeles is flowing at the rate of 100 barrels per day.

The last day of 1878 was a rainy one throughout California. The rain-fall in the southern portion was heavy.

Delaware.

T. R. Smith's mill at Lincoln, burned. No insurance.

Florida.

Cedar Keys shipped 840,000 pounds of fish last year.

Ice formed in Jacksonville Jan. 8th, for the first time in 30 years.

Iowa.

Iowa Falls is to have another oat meal mill.

H. Hanchild, grain dealer and elevator owner at Belle Plaine, has failed.

A stock dealer at Le Mars, recently purchased 10,000 bushels of corn for 8 cents per bushel.

It is estimated that rats have done a million dollars worth of damage in the State during the past year.

Illinois.

Chas. Alken, a Chicago mill-owner, died recently.

Asa Dow was elected President of the Chicago Board of Trade January 6th.

Receipts of wheat at Chicago for the year were 30,000,000 bushels; of flour, 3,120,000 barrels.

The Honore block in Chicago was partially burned January 4th. It contained the Post-office, military headquarters, railroad and law offices. Damage, \$100,000 to \$150,000. Fully insured.

A summary of the manufacturers of Chicago foots up, in round numbers, 2,617; the number of workers is 67,504; the aggregate wages paid is \$31,007,000; capital employed, \$85,782,000, and the value of the product, \$227,560,000.

Chicago city mills manufactured last year 300,000 barrels of flour. The direct exports of flour from that market during the year were about three times as large as in 1877, and indications are favorable for a growing business.

Indiana.

Nordyke & Marmon Co., of Indianapolis, are shipping burrs, gearing and bolts for a model little custom mill to W. A. Adams, of Greenville county, South Carolina.

The following letter to Nordyke & Marmon Co., explains itself: "Office of Attica Mill Co., Attica, Ind.—I inclose N. Y. draft for full amount of your bill, and accept our thanks for favors shown us. Since we replaced the

— purifier with the Smith we are doing excellent work. Yours truly, J. C. Aylesworth, President."

Iowa.

New flour mill at Topeka soon.

The State Treasurer at Topeka paid off all claims for salaries, December 31st, in gold.

Verling & Hale, proprietors of Pioneer Mills, at Florence, have dissolved partnership.

The Atchison, Topeka & Santa Fe road has reduced its passenger rates to four cents per mile.

Thermometer indicated 18 degrees below par during New Year's week in different localities in the State.

Work on the railroad to Cawker City has commenced. Cawker City is the liveliest town in the State just now. A corner lot just sold for \$1,000.

Kansas is a growing State. In 1860, says the Atchison *Champion*, she had only 8,600 inhabitants, and now her population is no less than 750,000, with the prospect, in another year, of having 1,000,000. In 1860 she raised but 194,173 bushels of wheat; in 1878 she raised 32,000,000 bushels. In 1860 Kansas raised only 6,150,727 bushels of corn; in 1878 she raised over 100,000,000 bushels, and from present indications next year's crop will far exceed this.

As an example of the extent to which the

milling interests have grown in the State of Kansas this last season, we will state that the Nordyke & Marmon Co., mill furnishers at Indianapolis, Ind., have shipped to the above named State complete flouring mills, which were erected at Burrton, Wichita, Pawnee Rock, Washington, Cawker City, Parsons, Lane, De Soto, Abilene and Sun City, making ten complete mills, which will add 240,000 barrels of flour to the annual production. Nebraska has improved greatly also in the same line; orders for complete mills being received by Nordyke & Marmon Co., from that State, and built at Gibbon, St. Paul, Seely, Central City, Clarkeville, Harvard, York, Valparaiso, Norfolk, Glen Rock and Roca Station, making eleven new mills, all of first-class machinery, turning out the best of flour.

Kentucky.

Charles Long, of Nicholville, recently attempted to light a fire from a coal oil lamp. The lamp exploded, fatally burning Longly and one child, and seriously burning another child. The house caught fire and was entirely destroyed. He built the fire though.

Louisiana.

The yellow fever investigating committee have completed their labors at New Orleans and have returned to Washington to prepare their report.

At New Orleans a project is under discussion for the establishment of a gigantic cotton warehouse, capable of containing 2,000,000 bales each season. The site has been selected, and has a river frontage of nearly half a mile. There will be eight presses each with a compressing capacity of 2,000 bales every 24 hours.

The New Orleans papers speak of an important revolution in sugar making in Louisiana, the old system giving way to what is now called the central factory system. The former plan was for each planter to be his own sugar maker; the new one is for the planters to take their cane to a central sugar factory, leaving them to manufacture it into sugar and molasses. The merits of this system are that it renders it unnecessary for every planter to own a large and costly sugar mill; that it enables small farmers to have a local market for their cane crop, and that by concentrating the sugar making for a district into one large establishment, supplied with improved machinery, it insures a more perfect expression of the juice from the cane, greater economy in the manufacture, and a better quality of sugar.

Minnesota.

Archibald mill, at Dundas, is being greatly improved.

A company has been formed to build a flour mill at Medina, Benton county.

Red Wing millers want the Legislature to change the law relating to grading grain.

It has been concluded to rebuild the Dundas steam flouring mills larger and better than before.

A stock company has been formed for the purpose of building a flouring mill at Minden, Benton county.

The New Ulm steam flour mill uses bran for fuel. It will only sell for \$5 per ton and wood costs \$4 per cord.

The millers of Red Wing are offering 300,000 bushels of Northern Pacific wheat of the crop of 1878, to farmers, at cost.

A Bohemian at Owatonna recently fell off a load of bran and broke his neck. He might better have fallen on to a load of bran.

The new mill being built at Mankato by R. D. Hubbard & Co., will have 12 run of stone, with a capacity of 500 barrels per day of 24 hours.

Many mills in Minnesota have stopped doing merchant work and confine themselves to custom work on account of the poor quality of wheat in their section of the country.

The Rochester *Post* says it is undecided whether Mr. John M. Cole will rebuild his mill or not. Including the original purchase money, the mill and elevator cost \$75,000.

A company has been formed who will build a new grist mill in Benton county during the coming year at Minden. The men who have this enterprise in hand are Messrs. D. S. Burns, J. G. Brennan and Wm. Brennan.

B. F. Paul purchased at his mill at Henderson, on January 7th, 8,000 bushels of wheat. Over one hundred wagons were at the mill during the day. Seven thousand bushels of wheat were taken in at the mill in three days.

The Winnebago City *Press* says: "Bran is now being used exclusively at the Winnebago City mills for fuel. It is worth about \$3.50

per ton for fuel. From a day's burning there is about a bushel-basket-full of clinker results."

The Red Wing *Advance* gives some business statistics, showing a grand total of 190 business houses, companies and corporations, giving employment to 1,110 persons, whose total sales or business transactions amounted to the sum of \$9,851,724 during 1878.

Messrs. Griggs, Johnson & Foster, of St. Paul, are about to build a large flouring mill at Duluth. The location is a favorable one; 200,000 bushels of wheat are now in the Duluth elevators awaiting opening of navigation. The total elevator capacity is said to be 360,000 bushels.

L. F. Hodges in his report to the St. Paul Chamber of Commerce highly condemns the "little brass kettle" used in testing wheat, and promises to submit evidence of a startling nature before a Legislative committee of investigation. He contends that it is a great swindle on the farmers.

The proprietors of the new Diamond flouring mill at Owatonna, give notice that after January 1st they will confine their business to custom work, it being impossible to make from this year's crop a brand of flour which shall successfully compete in outside markets with that made from the better grades of wheat in the northern parts of the State.

Strait, of Minnesota, has introduced a bill to promote and improve the navigation of the Mississippi River, which provides that the sum of \$150,000 be appropriated, to be expended under the direction of the Secretary of War, for the purpose of testing the practicability of improving the navigation of the Mississippi River at such point or points as he may deem best for the interest of the Government, by the use of the "Adams patent flume;" provided, however, that the patentee, M. I. Adams, shall have the full control, supervision and management of the laying of said flumes.

Missouri.

Kansas City is attempting to organize a Chamber of Commerce.

H. Euler's new 2-run flour mill at De Soto has just been completed.

It is reported that I. M. Cannon & Co., mill-owners, of Neosho, have failed.

St. Louis Beef Canning Factory burned January 5th. Loss estimated from \$75,000 to \$100,000. Insured.

J. R. Hamacher, at Richmond, is putting up a new mill which is a model in its way. It is three-stories high, including stone basement, frame, 32 by 36 feet, three runs of stone, and motive power of steam. There is an addition 20 by 36 feet for a carding machine. When this mill is fully completed it will be an addition to the business interests of Richmond.

A St. Louis correspondent says: "Our manufacturing establishments continue active. The iron and metal trade remain unchanged, with satisfactory results for the year. Machinery and hardware dealers do not complain, yet at present are quiet—in fact, winter stillness prevails in all trades except in holiday goods. We are rich in cotton, grain and provisions of all kinds, at bed-rock prices. It does seem as though a magnificent prosperity must rise from our enormous surplus of farm products."

The Chicago *Journal of Commerce* says that Mr. Charles Francis Adams has bought lots at Kansas City worth \$40,000, and will build on them a cotton mill and cottages for workmen. Items of this kind are valuable, inasmuch as they indicate the fact that Kansas City is a growing and prosperous place, and a new industry of the kind contemplated will add to her importance. That mills of this kind will pay well in that locality there can be no doubt. Kansas City can obtain her cotton by river from the South, and by rail from Texas, at reasonable freight rates, and the distribution of manufactured goods will extend to all points directly tributary to her. Wherever cotton mills have been erected in the South or West, they have flourished and proved a source of wealth to their proprietors.

Massachusetts.

Gov. Talbot inaugurated January 1st. Total debt of the State, \$83,020,404, all funded.

The Knowles Steam Pump Works, of Warren, have a large contract with Salt Lake City parties to furnish two huge pumps for emptying silver mines. One pump is to have a forty-four inch steam cylinder and a pumping capacity of 8,000,000 of gallons daily, while the second will be larger yet. As the first machine must be ready in six weeks,

extra machinists are to be hired and the shops run day and night.

Maine.

Some 2,500,000 bushels of grain passed through the Portland elevator during the past year. Of this amount 900,000 were wheat, 950,000 corn, 350,000 peas, 200,000 barley, and 100,000 oats.

Michigan.

Samuel Shattuck of Shattucksburg, has sold his mill.

John Soners, of Hillsdale, has sold his mill to D. B. Kingon.

Price & Carroll, millers, at Monroe, have dissolved partnership.

Chas. Smith, whose saw mill at Davison was recently burned, is now rebuilding it.

G. E. Dunbar & Co., mill-owners, at Kalamazoo and Comstock, have been burned out.

One hundred and forty barrels of flour were recently shipped from Constantine direct to France.

New York.

Humphrey & Fraley, millers, of Mt. Morris, are reported to have failed.

Peter Fonda, of Humphreysburg, has sold his mill to John M. Felts.

D. T. Wyman has bought out and is running the grist mill at Crown Point, formerly run by D. Wyman.

The Buffalo *Commercial* prints its annual statement of the lake trade of that city, showing that the receipts of flour have been heavy, reaching nearly 1,000,000 barrels, but that they were not so large as in several preceding seasons. The arrivals of grain, however, were far ahead of anything on record. Last year's totals reach 83,547,233 bushels, or nearly 11,000,000 bushels in excess of the best previous year. The lumber trade also shows a marked improvement over the two previous years, the aggregate receipts being 175,820,899 feet, to 139,781,000 in 1877, and 114,582,000 in 1876. But, outside of grain and lumber, the down lake movement shows a general decline, which accounts for the low rates of freights that prevailed last season.

Nebraska.

The Buzile flour mills, at Buzile, are turning out first-class work. Additional machinery is being put in. The capacity will be 100 barrels of patent flour per day.

North Carolina.

North Carolina has in two years increased the number of her live stock 800,000, and their value \$4,500,000.

Arrangements have already commenced for a grand agricultural and mechanical fair at Wadesboro, in November, 1879. We are glad to notice such enterprises in the South.

Ohio.

S. Hughes & Co.'s flour mill, at Hamilton, burned January 4th. Loss, \$18,000. Insurance covers loss.

Levi Runkle's distilling and flouring mill, at St. Paris, burned January 3d. Loss, \$17,000. Insurance, \$13,000.

The Buckeye Engine Company, of Salem, have now in course of construction one pair of 24 x 36 engines which they are building for the Merrimack Manufacturing Company of Lowell, Mass., which will receive much attention, as they are to be connected direct to the line shaft and are to run at 160 revolutions, dispensing with all belts and gears. Each cylinder is to develop 500-horse power.

Pennsylvania.

On January 4th 700 coal miners near Pottsville struck for higher wages.

Philadelphia boasts that she exported 27,000,000 bushels of grain during 1878.

Philadelphia is to have a line of Dutch steamers to Mediterranean and Baltic ports, the vessels belonging to the Royal Netherland Steamship Company. The pioneer steamers will be the "Stad Amsterdam" and "Stad Haarlem."

The Wingohoching steam flour mills, at Wingohoching Station, are doing an excellent business. These mills are among the oldest and most celebrated in Pennsylvania, and the owners are well deserving of the good patronage received.

The rapid increase in the trade of Philadelphia may be inferred from the fact that in 1878 were received here 970,781 barrels of flour, against 749,830 barrels last year, an increase of 230,451 barrels. Our receipts of corn were 20,261,675 bushels, against 18,926,300 bushels in 1877, the increase this year

being 6,835,375 bushels. Our receipts of wheat were 4,485,000 bushels, against 4,107,400 bushels last year; increase, 378,600 bushels. The receipts of oats were 4,484,000 bushels, against 2,505,300 bushels last year; increase 1,879,700 bushels. The receipts of barley increased from 962,400 bushels in 1877, to 1,346,200 bushels in 1878. Of petroleum 1,900,310 barrels were received, against 1,102,928 barrels last year; increase, 797,482 barrels. We exported (in round figures), 75,400,005 gallons of petroleum, against 49,167,000 gallons in 1877.—*The Press.*

South Carolina.

The Union Cotton Press warehouse with contents at Charleston, burned January 1st. Loss, \$575,000.

Jas. Scott, of Greenville county, is building a custom mill of medium capacity, the burrs, machinery and bolts having been ordered of Nordyke & Marmon Co., of Indianapolis, Ind.

Texas.

The San Marcos (Texas) *Free Press* says: "Major Nance's new mill and gin is run by a Bookwalter engine, and is very complete. It is three-stories high, and cost altogether between \$25,000 and \$30,000. Major Nance himself has some 10,000 bushels of wheat stored in it, and various other parties have also large quantities, yet there is room for more. The mill is run on what is called the new process, by which the yield is increased and the flour made livelier, stronger and whiter."

The Star flour mills, now being erected in Galveston, will be of four stories, containing five runs of stone now, and four more to be put in by and by, making nine in all, with one pair of steel rollers. The engine will be 125-horse power. The upright of the structure will be heavy frame, weatherboarded, and then covered with corrugated iron, and all surrounded by a fire-proof slate roof. The entire building is to be completed, and the machinery in it running, on or about the last of February.

Wisconsin.

M. Graham, of Oil City, is going out of the milling business.

Counterfeit silver quarters are plenty in La Crosse and vicinity.

Geo. Bruce, of Milwaukee, has bought the Johnson mill at Omro.

Messrs. Mayers, Paepke & Co. have just started their new sawmill at Neenah.

Vraren & Starwell's saw mill, at Green Bay, burned January 5th. Loss, \$6,000. Insurance, \$3,000.

Anson Eldred & Son, proprietors of the saw mills at Oconto and Little Suamico, are talking of moving their mills to Fort Howard.

At Hiner's foundry in Fond du Lac, recently, a young man named Bissex got his arm caught in a belt while slipping it on, and was thrown down and his arm broken.

The Waupaca merchant flouring mills complain that the little custom mills in the neighborhood capture most of the wheat in the vicinity, by making extra offers to the farmers.

Sheboygan county shipped 5,827,476 pounds of cheese during the year of 1878, of which 2,000,000 was shipped directly to Liverpool. S. H. Conwer, of Sheboygan, is the leading shipper.

The Eclipse Windmill Company, of Beloit, have recently shipped five mills to Cuba, and are now making a number on an order from France—as a result of their display at the Paris Exposition.

Milwaukee Items.

Madam Elizabeth Puliva Schilz died January 1st, aged 104 years.

The best St. Louis winter wheat flour is being sold extensively by some grocers in this city for \$5.75 per barrel. Many say they prefer it to the best patent.

The Milwaukee brewers and ice houses have been laying in an immense stock of ice of excellent quality. Most of these institutions this year have been supplied with a patent ice elevating machine, which greatly facilitates the work. The horse and pulley have been exchanged for steam power and elevating machinery.

Voechting, Shape & Co., sole bottlers of Schlitz celebrated lager beer, have built up so large a business that they have found it necessary to move into more commodious quarters on the corner of Second and Galena streets. They ship beer not only to all the States and Territories and Canada, but very extensively to Central and South America, the West

Indies, Australia, and even to the *Waterland* itself. Among their customers for this celebrated beverage they have a few hundred of "ye jolly millers" in different parts of the country. The baker, brewer and miller have always been good friends.

Canada.

Marlmens' saw mill and factory at St. Roch, Quebec, burned January 5th. The watchman was suffocated by the smoke.

Mexico.

A barrel of flour which costs \$6 in New York City before it can reach the City of Mexico is subjected to charges amounting to \$23.03, so that in order to cover cost it must sell for \$29.03.

Foreign.

Prussia has 25,724,404 inhabitants.

The plague has broken out in Astrachan.

Juan Moncasi was executed at Madrid, Spain, Jan. 4th. He attempted to assassinate the King.

R. Hudson & Co., seed crushers, of London, have failed, with liabilities amounting to £105,000.

At the census taken last September, the city of Tokio, Japan, was found to contain 1,036,771 inhabitants and 276,961 houses.

Steam plowing has been successfully introduced into Algeria. It is said to have increased the wheat yield 50 per cent.

The price of wheat is so low in England that an agricultural paper advises farmers to feed it (wetted and allowed to ferment) to stock.

There were \$300,000,000 worth of quicksilver taken from the mine at Almaden, Spain, since the year 1564, being an average of about a million dollars per year since it was opened.

The Grand Duchess of Hesse-Darmstadt, Princess Alice of England, died at Darmstadt at 7:30 a. m., Dec. 14th, of diphtheria. The Court generally will be in mourning for twelve weeks.

A Magasaki (Japan) paper tells us that wheat grown in that country from American seed is magnificent, averaging a far finer yield than the same wheat at home, or the Japanese wheat grown from native seed.

The Cornish bank at Truro, Cornwall, suspended January 4th. The bank had an authorized issue of £49,000. Deposits about £5,000,000. The Cornish traders will suffer greatly. Many failures will be caused. Work in the mines has or will be suspended, and the outlook is gloomy.

A remarkably large specimen of French burr mill-stone was exhibited at the Paris Exhibition. It was from the Fontaine quarry, and was made from a single block measuring five feet in diameter and twenty-five inches thick. It has been purchased by a Birmingham, England, miller.

The Hungarians are greatly alarmed at American competition in breadstuffs; they see that America can supply the English market with all the grain required at rates which would leave them but little profit, notwithstanding the high reputation of Pesth flour; the occupation of Bosnia has had a depressing effect upon trade.

The United States Consul at Barcelona, Spain, Mr. Schenck, announced to the Washington authorities, recently, the arrival of the first cargo of wheat that ever was imported to that place from America. The cargo consisted of 72,000 bushels of Minnesota wheat, was carried in an English steamer, and the freight cost \$18,000. There was great excitement at the place, and the grain was pronounced equal in quality to any ever received in that market. The Consul reports that one firm at once engaged three English steamers to bring three cargoes of American wheat to Barcelona, and it was thought that about thirty-five cargoes would arrive during the season, all in English steamers.

FROM BUDAPEST, HUNGARY.

[Special Correspondence United States Miller.]

BUDAPEST, Hungary, Jan. 15th.—In addition to or rather as rectification of the two articles about milling in Budapest, and especially about roller mills, contained in the last two monthly editions of the *UNITED STATES MILLER*, I beg to give you the following statistics concerning the present state of milling with rollers in Budapest.

The most experienced millers of the Capital of Hungary have easily availed themselves of the eminent services the roller mills would render to them and have introduced them to

first time in Europe, on the largest scale in their renowned high grinding system. In this way high grinding on stones is quite supplanted by grinding on rollers, and this to the great benefit of the mill-owners as well as of their customers.

By this time the application of mill-stones is here confined to finishing off soft middlings, whilst all other intermediate operations, the consecutive crushing of grain as well as the grinding and finishing of pure semolina being done entirely by roller mills.

In ten of the most prominent mills at Budapest, 505 roller mills from Ganz & Co. are now working (in Ofenpest mill alone 140, Concordia mill 73, and so on), the excellent and finished make of the machines as well as the indestructibility of their famous chilled cast-iron rollers having proved them to be superior to all other kinds of roller mills, and has favored their introduction into the most important mills of the world. The "Pester Walz Muehle" at Budapest, the oldest and one of the largest flour mills in Hungary, a description of which you gave in your October number and mentioned also in your November number, delivered the following testimonial, which seems interesting enough to be inserted here:

"Budapest, July 16th, 1877.—Messrs. Ganz & Co., Budapest—Gentlemen: The most satisfactory results which, on testing the different crushing (wheat-breaking) machines, we obtained from your fluted rollers induced us to adopt your system and, in consequence, we already provided our mill with a great number of your breaking-rollers. In consideration of the experience derived from use of these rollers we beg to point out as particular advantages of your wheat-breaking system that extremely little crushed flour is produced, provided the rollers are used as directed; that your rollers most satisfactorily do detach the semolina from the bran, and thoroughly separate the germ particles; finally, that they are of an astonishing durability, and that it requires no skilled laborer to manage them. Moreover it must be stated that your system suits perfectly well any process of breaking wheat. It affords us so much more pleasure

to give you the above account, as we are inclined to think that by the construction of these rollers you have achieved an essential progress in the milling industry. Yours truly,

PESTER WALZMUEHLE-GESELLSCHAFT.

Riedle, m. p. Burchart, m. p.

Believe me, gentlemen, with service at your command, to be yours truly,

PROF. M. GRUENBAUM.

FIRE AND CASUALTIES.

Irvine mill at St. Paul burned January 23d. Loss about \$10,000.

J. Westley & Sons mill at Blisworth, England, burned January 2d. Loss, \$15,000.

December 31st, 1878, Charles Smith's saw and grist-mill, at Flint, Mich., valued at \$12,000, was destroyed by fire. It was insured for \$3,000. The fire was said to be incendiary.

CHARLESTON, S. C., Jan. 17th.—News is just received here of the burning on Wednesday of the Keithfield rice mills, on Black River, Georgetown county. Total loss, \$30,000. The mills were owned by Robert Adger, of Charleston, and insured for \$10,000.

Friday morning the large grist mills three and a half miles south of Stevens Point were destroyed by fire, also a dwelling and cooper shop with about 1,000 bushels of grain. Loss, \$10,000; insurance, \$5,000. The farmers lose about 500 bushels of grain which was to be ground.

GENESEE, Ill., Jan. 21st.—The flouring mills of W. Kidder were burned last evening. The fire caught in the debris around the corn sheller, at 6 o'clock, and by 8 o'clock the walls had fallen in. These mills were among the finest in the State, costing originally \$37,000, and had a capacity for 200 barrels of flour per day. They had been running at full capacity for some time, and the shipments of flour for 1878 amounted to 25,000 barrels. There was \$12,000 insurance on the building and stock, of which amount \$4,000 worth was burned. The property was fully insured. Over twenty men are thrown out of employment.

THE LATEST IMPROVED HUGHES BRAN DUSTER.

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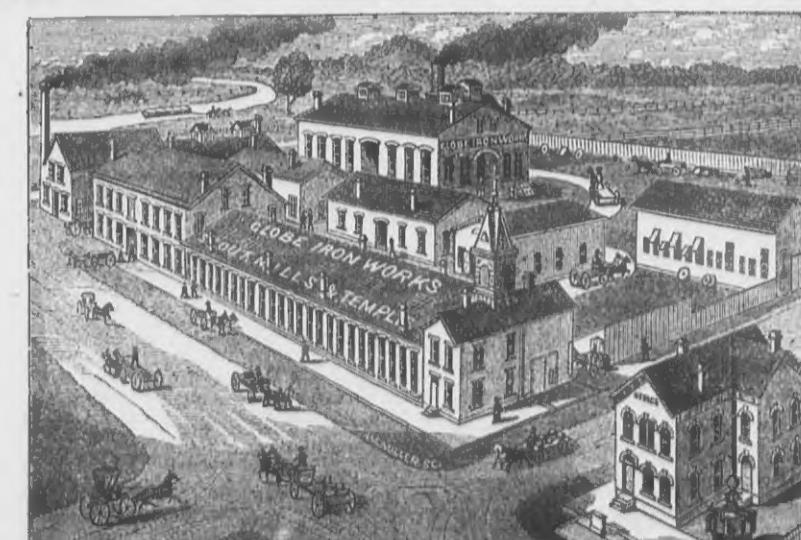
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A CHALLENGE!

As all manufacturers of Bran Dusters claim their machines to be the best, we will agree to pay for any machine made in the world that will compete with ours, and be adjudged superior by competent judges, provided any other party will do the same with us.

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Situations Wanted, etc.

Millers, Engineers, Mechanics, etc., wanting situations, or mill-owners or manufacturers wanting employees, can have their cards inserted under this head for 50 cents per insertion, cash with order.

WANTED—A miller with \$1,500 capital to take an interest in New Process water mill. Write at once for particulars to S. & C., care United States Miller, Milwaukee, Wis.

WANTED—By the first of January, 1879, a situation in a good Merchant or Custom Mill. Satisfaction guaranteed or no pay. Address J. B. WOOD, Janerville, Chester Co., Pa.

WANTED—A situation by a young man that can grind all kinds of grain, dress the corn burr, and who is a good hand with horses and will work cheap. Address J. ELLIS, Earlville, Ill.

WANTED—A miller who is capable of running a Merchant and Custom Mill. Must be a good stone dresser and able to grade flour. Apply, stating terms and giving reference, to R. F. SOADY, Columbus, Miss.

WANTED—A first-class custom miller, one who has made grit grinding a success, and can come recommended as such. To the right man a steady situation either on wages or shares will be given. Address F. DICKSON, White Island, Ind.

WANTED—To operate a mill on shares. Young man, 24 years of age, energetic, of steady habits, with best of reference from present employers, Indiana or Ohio preferred. Address B. C. MILLER, Jan. 280 N. Mississippi St., Indianapolis, Ind.

WANTED—Miller—one who thoroughly understands the German system of High Milling and the New Process American Milling. Address if convenient in the German language. FRED AMENDT, Abbeyville, Medina, Ohio.

WANTED—A situation by a Practical Miller and burr dresser who understands both old and New Process, dressing and balancing burrs & specialty. Any firm need of a miller will do well to address H. M., Box 139, Storm Lake, Buena Vista Co., Iowa, stating terms. Jan 21

WANTED—A situation by an Engineer. Learned the trade thoroughly in Germany, and am competent to act as Chief Engineer in any miller manufacturing establishment. Situation wanted in the Western States. Best of references given. Address J. O. SOEDER, P. O. Box 491, Kookuk, Lee Co., Iowa.

WANTED—A situation as engineer in a large or small mill. Have had 22 years' experience running high-pressure engines of different kinds, and 6 years operating Corliss engines. Can give best of references as to ability and character. Can go any time. Address dec 31 J. F. STRAIT, Box 109, Kalamazoo, Mich.

WANTED—A situation as helper or second miller, by a young man who can grind corn and wheat, and make himself generally useful. Of temperate habits and can give good references, etc. Correspondence solicited. Address N. P. COCHRAN, care of D. B. Williams, Elizabethtown, Ky. Jan*

WANTED—A situation by a thoroughly practical miller (German). First-class St. Louis reference. Satisfactory reasons given for leaving present situation, where I have been working for the past six years. Address Jan* 1913 Jackson St., St. Louis, Mo.

WANTED—A situation in a custom or merchant mill, for reasonable wages, by a miller who has had long experience in the business. Can run a mill, and take charge of it. Can come immediately, and will guarantee to give satisfaction. Address J. C. WEISS, Princeton, Wis.

WANTED—A situation in a Merchant or Exchange Mill by a practical miller and stone dresser who thoroughly understands the new process in both spring and fall wheat. Good references furnished. State terms and capacity. Address J. M. BELL, Pittsburgh, Iowa.

WANTED—A situation by one who has had a long experience in operating and superintending mills. Can come immediately and furnish the best of references if required. New Process preferred. Steady employment must be given or no one need apply. Address V. G. HAAG, Ewing, Franklin Co., Ill.

WANTED—By a young man wishing to make himself a home, a situation in some good mill as second miller, or would take a custom mill on shares. Can come well recommended as to custom work. Will come on trust, any terms for a steady job. Any one owning a mill, and not a miller himself, will do well to address Febt W. LEE, Racine, Wis.

WANTED—A situation by a miller of long experience in milling in both Germany and America. Has filled responsible positions in several well-known mills in this country. Will guarantee satisfaction. Is married, of steady habits, and can furnish reference as to ability and character. Address at once, J. M. B., care United States Miller, Milwaukee, Wis.

WANTED—A situation in a Merchant or Custom Mill by a young miller of fifteen years' experience. I am a good stone dresser, and understand the New Process. Have worked in some of the best mills in Michigan and Ohio. Would take position of second miller. Would prefer to go to the northern part of Ohio, or to Manitowoc. Address M. A., Box 349, Springfield, Ohio.

WANTED—A situation by a miller who is competent to take charge of a first-class Merchant Mill. Have had from 25 to 30 years' experience in the business, and can give good reference from first-class city and country mills. Also understand New Process as well as old. A situation in the Western States preferred. Address Jan* THOS. GREASLEY, corner Ferry and Main Sts., St. Louis, Mo.

WANTED—A situation in a Merchant Mill by a young married man, who is sober and industrious. A practical miller and good stone dresser. Understands both old and New Process. Good reference given if required. A permanent situation desired if satisfactory to all parties, and good work guaranteed. Address Jan* S. H. BLACKBURN, Box 275, Pittsfield, Ill.

WANTED—A situation by a miller of twenty years' experience in both Custom and Merchant Mills. Am an American, temperate and hold my last situation eleven years. Am a good stone dresser and have the best of recommendations. Would prefer a country mill, either on salary or shares. Can come at once. Address Jan* W. H. B., Box 114, Saratoga Springs, N. Y.

WANTED—A situation by a first-class miller and stone dresser who understands the old and New Process of milling. Have been in the business fourteen years, and now work in Merchant and Custom Mills. Am a married man, thirty-four of age, strictly temperate, honest and not afraid of work. Parties about to make a change will do well to correspond with me at once, stating terms, describing mill, etc. Address Jan* W. M. POWELL, Lyndon, Whiteside Co., Ill.

WANTED—An experienced miller and salesman desires a situation with some large milling and grain shipping firm as miller or salesman. I have had sixteen years' experience in this business, and now command a large cash trade in flour, wheat, corn, oats and mill feed. Can influence a trade of from two to three cars per day in these articles at market prices. For honesty and ability the best of references will be given. As a miller, I have Ohio and Pennsylvania references. Address Jan* MERCHANT MILLER, Chester, Delaware Co., Pa.

FOR SALE—A good custom and merchant mill, three stories high, built of stone, with three runs of burrs; good water power, close to railroad. Also two dwelling houses and all necessary outer buildings, all covered with slate. The mill has all been rebuilt, with middlings purifier and all necessary machinery. The mill is now running day and night. Good grain country. This property is a splendid home and business, and will be sold very cheap. For particulars call on or address E. G. GILBERT, Rauberville, Northampton Co., Pa. Feb*

For Sale or Exchange.

Advertisements under this head \$2 per insertion, cash with order.

FOR SALE—The Paris City Mills, with a good custom trade. For particulars, call on or address Jan* BOWEN, LAUGHLIN & CO., Paris, Ill.

FOR SALE—Cheap—a two-run merchant mill in a good wheat country, on the Illinois Central R. R. For particulars, address W. GILBREATH, Elkville, Jackson Co., Ill.

MILLING PATENT—To be sold cheap—A fourth share in a valuable Patent in Flour Mill Machinery. Thirty per cent guaranteed. Address PATENTEE, Jan* 39 Dryden Road, Edge Lane, Liverpool, Eng.

FOR SALE—A modern two-run steam mill in Western Iowa, on the line of the Chicago, Rock Island & Pacific R. R. New mill with all improvements. Apply to R. J. CORY, Council, Bluff, Iowa.

FOR SALE—A steam custom and merchant mill, with three runs of 3/4 foot stone. In good running order, and has a good trade. Will be sold cheap. For particulars, address W. M. CROZER, Elizabethtown, Hardin county, Ill.

FOR SALE—A Steam Grist Mill, two-run of stone and all other necessary machinery in good order. German neighborhood. Or I will sell a half interest to a Practical Miller. Address JOHN SPINDLER, P. O. box 21, Woodland, Barry Co., Mich.

FOR SALE—Two-run Steam Grist Mill, at North Union, Montgomery County, Ind., on L. C. & G. W. R. R. Will sell cheap for cash, or trade for land. Call on or address J. H. ARMSTRONG & CO., North Union, Ind.

FOR SALE—A whole or a half interest in a good three-run steam mill in a good wheat country. Mill doing a good business. Half will be sold very cheap. Address ROGERS & RAMBACH, West Liberty, Iowa.

FOR SALE—A mill site for a first-class water-power, 80 rods from the lake shore, on Pike River, three miles from Bayfield, Wis. The water-power will do the work of a 50-horse power engine. Address for further information E. PIKE, Bayfield, Wis. Jan*

FOR SALE—A good saw and grist mill, driven by 20-foot overshot wheel and abundant water-power, with 100 acres of choice land 1/2 of a mile from Brevard, Transylvania county, N. C. Price, \$5,000. Address Jan* DAWSON & CO., Charlotte, N. C.

FOR SALE—Steam power saw mill for sale cheap, and on reasonable terms. Mill is in good location, and is doing a good business. Satisfactory reasons will be given for selling. Call on, or address SMITH & TUCKER, Cawker City, Kan.

FOR SALE—A Steam Grist Mill, with two-run of stone, a Steam Saw Mill, two Houses, Barn, Shop, and 3 acres of Land, on Lake Shore Railroad, 15 miles from Buffalo, N. Y. Will be sold at a low price to close an estate. Address SELLEW & POPPLE, Dunkirk, N. Y. Jan*

FOR SALE—Water Mill Wanted to rent by a first-class miller—a two or three-run water power flouring mill, with privilege of buying. Will pay cash, rent, or give share of profits. Address FRANK A. MAINES, Georgetown, Williamson Co., Texas.

FOR SALE—To Exchange—Good fresh stock of general merchandise, best location in growing country seat, for a first-class custom flouring mill in a good location for permanent business. Kansas preferred. Give full description and cash valuation. Address Jan* W. H. WALLACE, Newton, Jasper Co., Ill.

FOR SALE—Mill Property for Sale or Exchange. A three-run Grist Mill and Saw Mill, all driven by water. Price, \$6,000. Would take part of the purchase price in Iowa, Nebraska or Kansas lands. Address BENJAMIN DEY, Worcester, Otsego Co., N. Y. Jan*

FOR SALE OR RENT—Cherokee Mill—A three-burr, 40-horse power, steam flouring mill, with all the modern improvements; situated in a wheat-growing country, with railroad connections and cheap fuel. Terms easy. Address S. ALBERTY & CO., Cherokee, Crawford county, Kan. Jan*

FOR SALE—The best Steam and Gin Mill in Texas; two-run of Burrs, Bolts, Sautter, etc. Two Gins and a Cotton Press; 40 horse-power engine and boiler; Wagon Scales; Good Buildings; Constant Work; Delightful Country. A bargain is offered. Address F. W. CARTER, Iredell, Bosque Co., Texas.

FOR SALE—Circular Saw and Grist Mill; bench saw; run of four foot stone; large pond; 20 feet head; good house and barn, and four acres of land. Located in West Northfield, Mass., three miles from South Vernon. Would take a good portable engine, 25-horse power, for part pay. Address E. O. FELTON, Bernardston, Franklin Co., Mass.

FOR SALE—A Wind-power Grist Mill with 60 foot wheel, three run of stone, cleaning and bolting machinery complete. Located in one of the best wheat-growing sections of Minnesota. Railroad will be built to the place next summer. Will be sold cheap and on easy terms. Address JOHN MANUEL, Elliott, Fillmore Co., Minn.

FOR SALE—Cheap for Cash—A Circular Saw Mill; mill in good order; plenty of lumber, and good wheat land surrounding. Parties need not apply unless they have at least \$2,700 to invest. Address for further particulars, G. F. BLASHEK, Maiden Rock, Pierce Co., Wis. Jan*

FOR SALE—One of the best mill properties in Michigan, consisting of flouring mill with three runs of burrs, saw mill, cooper shop, warehouse, store (with or without goods), light dwelling houses all in good repair, with barns and about 27 acres of land, 100 miles west from Detroit, on the Michigan Central R. R. Address JOHN EVANS, Marquette, Mich.

FOR SALE—One of the best two-run Custom and Merchant Mills in Hancock county, Ill. The mill is situated in the town of Hamilton, Ill., at the east end of wagon bridge leading into Keokuk, Iowa. Decidedly one of the best locations for a Custom Mill in the State. Can now run all the time on custom work, and is new, having been built the present season. Price extremely low. Address S. L. HOBART, Hamilton, Hancock Co., Ill.

FOR SALE—Mill—At a bargain—A first-class mill, cottage with five rooms, 1 1/4 acres of ground, out-buildings, fruit, etc. Mill heavy frame 70x30, four stories high, in good repair and doing a good business. Cost eight years ago \$13,000 to build. On a never failing stream, 12 feet head. Dam kept up by State. Boats land at mill door. Three run of best quality French burrs. Three water wheels. Grocery kept in mill. Terms \$7,000, cash \$2,500, balance on easy time. Write Jan* J. FRAZIER, at Devil's Dam, Marietta, O.

FOR SALE—Alabama Flour Mill—Two-run Custom and Merchant Mill in Springville, Alabama, complete. Excellent location. Good trade. Splendid climate. Mill close to a perpetual cold spring, furnishing water enough to run 15 or 20 horse-power turbine with 15 foot fall. Mill now uses steam power. Satisfactory reasons given for selling. Terms, \$1,500 down and \$500 in 12 months. Must be closed out soon. For further information address A. J. ADERHOLD, Springville, Ala.

FOR SALE—A 2-run flour mill. Good burrs and bolts in perfect order and doing a good business. Water-power has 14 feet fall, fed by large lake. No ice or floods to contend with. The mill makes good flour and there is plenty of grain in the vicinity. The mill lot contains 4 1/2 acres in the town with two dwelling houses, large barn and shed. With the mill will be sold 80 acres of timber land one mile from town. Terms, \$2,000 cash down, and balance in store goods or on five years time. Address for full particulars, WM. SKINNER, Mount Morris, Waushara Co., Wis. Feb*

For Sale or Exchange.

Advertisements under this head \$2 per insertion, cash with order.

FOR SALE—A two-run water power merchant flouring mill. For information and particulars, call on or address J. H. HARTWELL, Deputy, Jefferson county, Ind.

WANTED—A good steam flouring mill at Cawker City, Kansas. The location is exceptionally good. The best of wheat and other grains produced in great abundance. The investment will surely make heavy returns. The Atchison, Cawker City & Denver Railroad will be completed to this point on or before June 1st, 1879. Parties desiring to secure a good location may address for any further information.

EDMUND C. GARRETT, Cawker City, Mitchell Co., Kan.

FOR SALE—A superior mill site in southern part of Illinois, suitable for a custom and merchant mill. The location is in one of the best wheat-growing sections of the State, and enjoys railroad facilities to all points East and South. Also one engine and two 4-footed boilers in perfect condition. All will be sold at a bargain. For full particulars, please address

IMBES, MEYER & CO., 120 & 122 S. Main St., St. Louis, Mo.

FOR SALE—A flour mill on Pawpaw Creek, in Mecklenberg Co., N. C. Mill is a three-story building, first-story rock, second and third wood. Rock dam. Two run of stone, one for wheat and one for corn, with other machinery, run by 17-foot overshot water-wheel. Also saw mill with improved circular saws, etc.; 134 acres of land go with the property. Price, \$4,100. This is a fine opportunity for an enterprising miller to make a fortune.

Address DAWSON & CO., Charlotte, N. C.

FOR SALE OR RENT—One of the best steam flouring mills in the State. Four stories, brick and stone, slate roof, four run of burrs. Adapted to new process. Everything new. Best wheat region of the State. Fuel cheap, water plentiful. Near depot and has side track, cooper shop, wagon and stock yards. Pleasant town of 2,000 inhabitants. Satisfactory reason given; neither of us know anything whatever about milling. Terms easy. Fine bargain. Address C. H. HEARD & SON, McLeanboro, Ill.

FOR SALE—A 3 story frame Water-power Mill, with two-run of burrs. The machinery is in good order, improved purifier, mill arranged for both merchant and custom mill. The mill property includes barn, sheds and cottage, young orchard, 300 Acres of Land, 100 acres under cultivation, and the rest in hay and wild land. The undivided half of the above will be sold for \$4,000, part down, and the balance on time. Address L. W. DICKINSON, Sabula, Jackson county, Iowa.

FOR SALE—A steam grist and saw mill, located at Morton, Ind., 12 miles northwest of Greencastle, Putnam county. Mill in good running order; 1 wheat and 1 corn run—both in operation at present time, with a good run of custom work. Capacity of saw mill, 10,000 feet per day. Timber plenty and of easy access, mostly popular—with some walnut. For particulars and terms, apply at once to HATHAWAY & HATHAWAY, Greencastle, Putnam county, Ind.

FLOUR MILL WANTED—In Exchange—I have the exclusive right of 20 Counties in the State of Michigan to manufacture and sell Elliott's IMPROVED or CENTENNIAL HARROW, with \$1,000 worth of Harrows on hand ready for the Spring Market, which I wish to trade for a good Custom Mill. Would be willing to take property with some encumbrances. The Harrow mentioned is the best one yet manufactured, sells readily as every farmer wants one, and yields a net profit of 200 per cent on cost of manufacture. Being a practical mill I prefer to confine myself to that business. Address J. M. SHACKLETON, Plainwell, Allegan Co., Mich.

FOR SALE—Flour and Saw Mill—One-half interest in a first-class three-run Steam Flour and Saw Mill. The saw mill is a double rotary, with gang edger, cut-off and bolt saws and shingle machine. It has been built but 18 months, and is in as good a wheat country as there is in the State. My object in selling is to have cash in hand to put in a good country store in connection with mill. Would prefer to sell to a miller or a man that is well posted in store business who can command from \$6,000 to \$7,000 and furnish good reference—will guarantee good margin to the trade. Address all communications to A. J. FULLERTON, Bondur, Shawano Co., Wis.

FOR SALE—Mill—Cheap and on easy terms—A Water Flouring Mill, 1 1/2 miles from the depot at the city of Muncie, Ind. It is on Buck Creek, a never failing mill stream; the same being fed by springs. The mill house is a two-story frame. There are 3 runs of burrs, two for wheat and one for corn. There are 40 acres of land belonging to the premises, having thereon both plow-land and pasture-land; a good orchard, a variety of small fruits; a frame dwelling with six rooms and a hall, and a cellar to it. For particulars, refer to J. H. & S. E. HURST, proprietors, Muncie, Ind., or to C. W. MOORE, Attorney at Law, Muncie, Ind.

FOR SALE—Merchant Mill—A valuable steam flouring mill, situated at Claremont, Ill., 125 miles east of St. Louis, on the O. & M. R. R. This mill has six run of stone, capable of making 1,200 barrels of flour per week, together with all modern improvements. Machinery all first-class. Plenty of storage, and an abundance of good soft water. Fuel cheap; railroad switch to the mill door. Good cooper shop, with 10 berths. New office in mill yard, platform scales, stock pens, etc. Good dwelling house, etc., with 17 acres of land. Property known as Clement Mills. The flour made at this mill stands high in New York, Boston and Baltimore markets. For further information, address ROBERT BYERS